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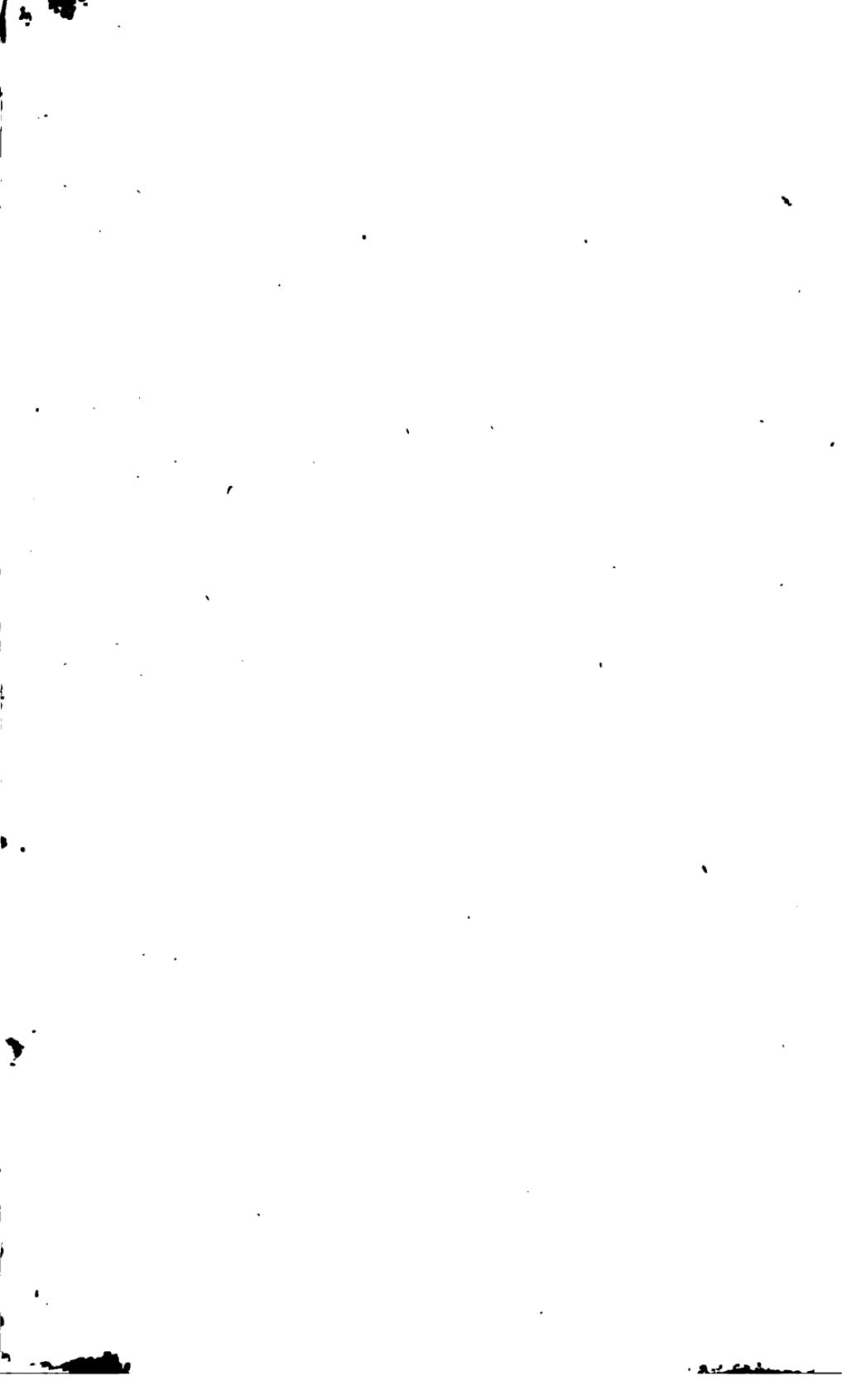
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THE
DUBLIN JOURNAL
OR
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THE
DUBLIN JOURNAL

OF
MEDICAL AND CHEMICAL SCIENCE;

EXHIBITING

A COMPREHENSIVE VIEW

OF THE

LATEST DISCOVERIES

IN

**MEDICINE, SURGERY, CHEMISTRY, AND THE COLLATERAL
SCIENCES.**

VOL. VIII.

DUBLIN:
PUBLISHED BY HODGES AND SMITH,
21, COLLEGE-GREEN;
LONGMAN, REES, & CO. AND SIMPKIN, MARSHALL, & CO. LONDON;
MACLACHLAN AND STEWART, EDINBURGH; AND
SMITH AND SON, GLASGOW.

1836.

Printed by R. GRAISBERRY.

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ERRATUM.

Throughout Dr. Graves's Paper in the Transactions of the Medical Section of the British Association, for "chloride of sodium," read "chloride of soda."



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NOTICE TO CORRESPONDENTS.

Press of matter compels us to postpone our Notice of Dr. Macrobin's Introduction to the Study of Practical Medicine, as well as Mr. Ingleby's paper.

Dr. Lendrick's valuable communication on Diffuse Cellular Inflammation did not reach us until the original articles were printed; it shall appear in our next Number.

We earnestly request our correspondents and contributors to furnish us with legible and even tolerably fair manuscripts. If gentlemen would recollect how much the effect of their written communications in general depends upon the facility with which they may be perused, they might be induced to pay more attention to penmanship. We find it utterly impossible to form any judgment of the value of some communications until decyphered by the printer's compositor, to whom it is rather expensive to refer, should it afterwards become necessary to cancel them.



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NOTICE TO CORRESPONDENTS.

We have to apologize for the omission of our notices of several valuable and interesting works transmitted to us for review. The present Number of the Journal contains a supplementary sheet, to enable us to dispose of pressing engagements, yet we find that the space allotted to this department has been pre-occupied, and that time does not permit us to rectify the error. The authors may rely to their appearing in our next.

NOTICE

TO THE EDITORS OF PERIODICAL WORKS ON MEDICAL SCIENCE.

As the Editors of this Journal have hitherto experienced much difficulty in procuring the Journals and Reviews published in Italy, America, and even in France, they take this method of reminding the conductors of such publications of the importance of using their influence to promote an uninterrupted intercourse between persons engaged in the publication of periodical works of science.

American authors will, perhaps, scarcely believe that their works cannot be procured at this side of the Atlantic, and the editors of the Italian Journals will probably be surprised to learn, that we can rarely enjoy an opportunity of availing ourselves of their labours. To remedy this evil, we propose to forward this Journal in exchange for any similar work transmitted to us through the houses of Berthes and Besser, Hamburgh, J. B. Balliere, Rue de l'Ecole de Medicine, Paris, Longman and Co., Paternoster-row, London.

The authors of pamphlets, academic theses or essays, *brochures*, or other brief works, which, from their small size, are liable to escape notice, are invited to transmit copies through the same channels.

THE
DUBLIN JOURNAL
OF
MEDICAL AND CHEMICAL SCIENCE,

1 SEPTEMBER, 1835.

PART I.
ORIGINAL COMMUNICATIONS.

ART. I.—*Case in which several Metallic Bodies were found in the Stomach.* By ROBERT HARRISON, M. D., one of the Professors of Anatomy in the Royal College of Surgeons of Ireland, and one of the Surgeons of the City of Dublin Hospital.

ALTHOUGH the particulars of the following case present but little interest in a practical point of view, they may afford a subject for some interesting reflections to those who feel pleasure in collecting specimens of what is rare and curious in professional experience. In medical science, the principles of which are not altogether fixed, such cases are not without their use, as they occasionally involve considerations of general utility, and not unfrequently lead the mind of the thoughtful observer into a train of speculative reasoning, which prompts to further investigation and to more close inquiry, and thereby they may ultimately lead to the acquisition of useful knowledge, and to the elucidation of matters of obscurity and of interest. Under this impression I am induced to state some facts, which in

2 Dr. Harrison's *Case of Metallic Bodies in the Stomach.*

common with others I observed a few days since, in the abdomen of an old man of the name of Wall, whose body was brought for dissection into the school of this College. With the living particulars of this individual I am almost wholly unacquainted ; and shall therefore only mention, that he had been, as I am informed, confined in a lunatic asylum in this city for many years, that his bodily health was in general good, that his habits and propensities were so mischievous as to render him extremely troublesome, and that he had an uncontrollable desire to seize every hard substance, particularly pieces of iron, that came within his reach, to taste and to secrete them. I am not aware, however, of any observation having been made, during his life-time, of any ill effects having arisen from an indulgence in this feeling. In the course of the dissection sufficient morbid changes were discovered in the brain to account for death, on those, however, I shall not dwell, as at present I merely wish to notice the appearances which were observed (at first accidentally) in the abdomen. When this cavity had been opened, the attention of those present was at once attracted to the peculiar dark tinge of all the small intestines, which were distended with fluid of the same colour. The stomach, though nearly empty, appeared of inordinate size, its left portion extending nearly as low as the left ilium ; its coats felt remarkably thick ; the peritoneum was free from inflammation, and with the exception of the two circumstances already mentioned, there was no other abnormal appearance in the exterior of the alimentary canal. The liver was of the usual size and consistence ; its colour, however, particularly in the right lobe, was peculiarly dark, not the mere effect of sanguineous congestion, but of the same deep ferruginous hue already noticed as so strikingly seen through the intestinal tunics. There was no bile in the gall-bladder. The spleen, pancreas, kidneys, &c., all presented normal characters. On pressing and examining the stomach and intestines, several very hard and irregularly shaped bodies were distinctly felt ; one of these was

easily pushed with a slight force; which curiosity induced, through the arch of the colon, and was found to be a piece of iron of four or five inches in length. The stomach was then opened, and was found to contain a great quantity of dark mucous fluid, and several metallic substances, such as the rusty remains of large nails, long pieces of thin iron, like portions of iron hoops, a worn down blade of a knife, a large iron buckle with a pewter tongue, as that of a saddle-stirrup, an iron hinge of a box or door, and several small pieces of metal, too thin and worn to admit of their original use or form being in any way recognized; four or five pieces, in the same state, were also found in different parts of the intestinal canal, in addition to that already mentioned in the colon.

It may be worth observing, that all these iron bodies had undergone considerable corrosion or solution, as if in a weak acid; and it was curious to observe how this disintegrating process had taken place in one direction in decided preference to another, so as to present a very distinctly fibrous structure, as if the decomposition had proceeded more readily in the direction in which the metal had been drawn or beat, than in an opposite or transverse course. It may also be worthy of remark to notice, that while the rim of the iron buckle is nearly worked through by the solvent agent in the stomach, the pewter tongue is unaffected, and presents its full form and size. The interior of the stomach presented the following appearances: the muscular coat was decidedly hypertrophied throughout, the cardiac orifice was unusually large, but the line of demarcation between the oesophagus and stomach was peculiarly distinct; the mucous surface of the left portion presented no appearance that could be considered very abnormal, excepting the great development of the submucous glands, which were nearly as conspicuous as those in the crop of some granivorous birds. The pyloric portion of this organ was much more changed; the aperture of the pylorus was dilated to such an extent as to have obliterated the valve *in toto*; nothing but

4 Dr. Harrison's Case of Metallic Bodies in the Stomach.

the muscular ring denoted its former situation. The rugæ of the mucous membrane in the pyloric third of the stomach were unusually prominent, being elevated into firm, thick, vascular masses, so as to give the appearance of granulated projections or fungous growths ; there was, however, no abrasion or ulceration on their surface, nor any unhealthy secretion, as in malignant or fungoid diseases, which these appearances at first view resembled. On an accurate examination it was clearly ascertained, that these soft vascular projections were merely excessive developments of the natural rugæ of the stomach. The whole of this surface was deeply tinged with the same ferruginous sediment, as has been already noticed in the fluid contents of the alimentary canal, and which obviously consisted of particles derived from the gradual solution of the metallic bodies which were contained in the splenic end of the stomach. In a depression between some of the granulated elevations that have been alluded to, a small opening through the stomach was observed ; around this the coats were thin and hard, resembling the cicatrized circumference of a small ulcer, caused, in all probability, at some remote period, by some of those irritating substances, in the use of which the individual had indulged ; it did not appear, however, that any of the contents of the stomach had ever escaped through this opening.

On submitting a portion of the coloured fluid matter, which was contained in the alimentary canal, to a careful examination, the presence of iron was easily detected. This metal was found in abundance both in the precipitate or sediment, which was collected from the intestinal fluid, as well as in solution in the latter ; in the former it existed in the form of a sulphuret, in the latter it was combined with the muriatic and acetic acids.

When we reflect on the foregoing circumstances of this case we cannot fail to consider it as affording a strong instance of that truly surprising preservative power that exists in the animal economy, the influence of which we so frequently ob-

serve; not only in the resistance offered to the invasion of disease, but also in the successful contest it not unfrequently maintains against the determined destructive efforts of the suicide or the lunatic. As might indeed be anticipated, no system in the whole economy affords more remarkable facts in support of the foregoing remark, than the digestive apparatus, which may be regarded as the head and centre of organic life. Medical experience abounds in examples of the power of the stomach and intestines to resist the impression of deleterious substances, as well as to expel them from their cavity; there are, however, comparatively speaking, but few cases on record of mechanical irritants, such as have been mentioned in this case, continuing for any length of time in the alimentary canal, without producing any corresponding inconvenience or ill effect; for, with the exception of the very small ulcer in the stomach, there was no other appearance present which could be considered as decidedly diseased; even this ulcer did not seem to have produced any considerable inconvenience, nor to have admitted of extravasation of any of the contents of the stomach. Similar instances, in this latter respect, have not unfrequently occurred in my own observation of ulceration in this as well as in other parts of the alimentary canal, having existed during life, and yet no effusion of the contents had occurred. This fact evinces a power of adaptation in the parts affected to accommodate themselves to their altered condition, and thus more effectually to resist the fatal tendency of such a lesion in the structure of organs so essential to the continuance of life. I have frequently noticed, in the examination of bodies after death, in different parts of the intestine, distinct openings to exist, the obvious consequences of ulceration during life, and yet no extravasation had occurred, although on examining the parts engaged, and disturbing them from their former position, the contents of the intestine were then abundantly discharged, and close inspection shewed the free and distinctly ulcerated opening. This interesting fact may admit of explanation: also,

6 Dr. Harrison's Case of Metallic Bodies in the Stomach.

by considering that the ulcerative process had occurred so very gradually as to admit of all the surrounding parts adapting themselves so accurately and so closely, as to prevent any effusion from the perforation in the canal; some slight lymphatic adhesion too, not unfrequently cements these connexions; add to which, the gentle and properly adjusted contraction of the muscular tunic keeping the edges in sufficient apposition to prevent any escape of the parts within. Again too, in intestinal ulcerations, the surrounding mucous surface not unfrequently presents a pulpy mass, in part filling up the opening, and thus contributing to produce the effect that has been stated; in addition to all this, it is to be recollected, that the parietes of the abdomen give a general support to all parts of the viscera, and thus prevent the formation of a cavity into which the contents of the affected viscous could be easily discharged; all these circumstances may account for the comparative infrequency of abdominal effusion in consequence of ulceration of some of its hollow viscera, a phenomenon contrary to what might *a priori*, and without experience, be anticipated. From the foregoing statement it is not to be inferred, that effusion of intestinal matter never occurs as a consequence of ulceration, inflammation, and mortification of the viscera; on the contrary, it is by no means an uncommon sequela to peritonitis, when gangrene supervenes, for feculent effusion into the abdomen to take place to a great extent; and occasionally, too, in chronic and organic diseases of these viscera, fatal peritonitis is often, after protracted suffering, induced, and appears to have been the immediate effect of some part of the canal having given way, and allowed the escape of its contents, which have then become a continued exciting cause to the general serous inflammation which soon extinguishes the vital powers. Fatal effusion also frequently follows wound or rupture from blow of the abdominal viscera or of the urinary bladder. Ulcers in the stomach in general present a different appearance from that in the intestinal canal; the

surrounding mucous surface in the latter is often loose and pulpy, so as in some measure to conceal the opening; whereas, in ulcers of the stomach, the edges and the tunics in the vicinity are usually thin and firm, as if cicatrized, and the whole has the appearance as if a portion of a circular or oval form had been completely cut out, and as if the serous and mucous borders had then become closely adherent. The appearances which were noticed in the mucous lining of the stomach, in the case under consideration, exhibit another proof of the adapting power of this organ to the new condition under which it was placed; being now subjected to admit substances totally unfit for digestion, its capacity became greatly augmented, and a sort of reservoir was formed in which most of these bodies were retained; the secreting powers of the stomach appeared greatly increased, from the distinctness of the gastric glands, and the unusual development and vascularity of the mucous rugæ, hence a more copious supply of viscid mucus wherewith to sheath the surface of the organ, and in some measure to protect it from the irritation of the rough metallic bodies contained in its cavity; very probably also the peculiar gastric solvent fluid itself was increased in quantity and in intensity, with a view of decomposing the bodies which were immersed in it; our knowledge, however, of the peculiar qualities of this fluid can scarcely admit of such a point being clearly ascertained, much less positively affirmed. The pyloric orifice was dilated to such a degree, that its delicate valvular fold was quite obliterated, and hence several very large pieces of metal had passed through this opening without inflicting any injury to its circumference. The liver and spleen appeared healthy; the deep ferruginous colour of the former, however, is worthy of remark, as this phenomenon may be explained by, or adduced as a proof of, venous absorption, inasmuch as the vena portæ being the supposed agent for absorbing the ordinary fluid contents of the alimentary canal, and as it then branches through the liver with the same minute subdivisions as an artery, it is reasonable to

attribute the colour of this organ to the blood which it conveyed being strongly impregnated with this peculiar colouring matter; and this opinion derives confirmation from the circumstance of no other glandular viscus in this region being similarly affected, the pancreas, spleen, and kidneys presenting their ordinary appearances. This fact indicates the possibility of bringing medicinal agents into almost immediate contact with the structure of the liver. It is to be regretted that no bile was in the gall-bladder to admit of examination, so as to ascertain whether it also contained any unusual quantity of iron, as was found to have been the case in the bile of Cummings, the celebrated knife eater, recorded by Dr. Marcett, in the 12th vol. of the Medico-Chirurgical Transactions. Indeed among the several cases which are on record analogous to the present, none bears a more close resemblance to it, as far as relates to the appearances observed on dissection, than that of this individual. He was notorious for having swallowed several clasp knives with impunity at different times, and seldom suffered much inconvenience until the last performance, which may be considered as having ultimately put an end to his existence. He had swallowed thirty-five knives altogether, and lived ten years after the first experiment. On opening the abdomen after death, a black ferruginous tinge prevailed, which was also observable in the hepatic system. The colon was transfixated by a blade four and a half inches long, which was projecting into the abdomen; another was found stretching across the rectum, one end fixed in the muscular parietes of the pelvis. Although the intestines were thus perforated, no faeces had escaped into the cavity, and no inflammation had occurred. The stomach bore marks of altered structure; the lower end of the oesophagus and the upper orifice of the stomach were thicker than natural; the left, or splenic end, was natural, but the right was very much thickened; the mucous rugæ were unusually prominent, and there were granulated projections from their edges; the whole surface was slightly

coloured by the steel, the pylorus was natural, but the duodenum was much thickened. The contents of the gall-bladder partook of the black tinge of the abdominal viscera. On evaporating 150 grs. of the bile, which was black and alkaline, and then burning the dry mass in a platina crucible, the magnet immediately attracted ferruginous particles; the residue being also treated with muriatic acid and prussiate of potash; the quantity of Prussian-blue formed amounted to 0.5 grs. The presence of iron in the bile therefore was clearly shewn, and was proved by a comparative experiment on healthy human bile to be in much more considerable quantity than under ordinary circumstances. This appetite for knives is not very uncommon, and hence the medical journals and miscellanies afford descriptions of London, Prussian, Bohemian, and Brazilian knife-eaters; some of these examples have perished shortly after their firstfeat, others have lingered for years, and some few have wholly recovered. Several cases are on record of persons having this peculiar taste for hard substances, such as pieces of glass, stones, leaden bullets, pieces of money, &c, Borelli gives an account of a pantophogist who swallowed a hundred Louis-d'ors at a meal. Fournier relates the case of a slave who fell a victim to this appetite, whose stomach was found immensely enlarged, extending even to the pelvis; it might be compared to a sort of store-house, as it contained part of a stave nineteen inches long, and half an inch broad, two pieces of broomstick, six and eight inches long, twenty-two pieces of wood, a wooden spoon, a pipe of an iron funnel, three inches long and one broad, two pewter spoons, one of them seven inches long, a square piece of iron, weighing about two ounces, some nails, buckles, knives also; the whole weighing about two pounds. See *Dict. des Sciences Medicales*, Art. "Cas Rares."

It is a question not unworthy of consideration, whether such strange perversions from the natural taste, as have been noticed, are to be considered merely as the capricious indulgence of the lunatic or the idiot, or whether they may be con-

sidered, in some instances, as a timid and abortive attempt to commit suicide, either directly or slowly, as others, when labouring under severe mental depression, have been known to have resorted to total abstinence, in the hope of dying from inanition; or whether, according to the general principles of pathology, they may be referred to some peculiar state of the digestive apparatus.

Several cases of this description have been noticed by Dr. Good, in his *Study of Medicine*, vol. i. page 158, these he refers to the class of diseases which he calls "Limosis pica," or "depraved appetite." This desire for improper and indigestible substances may either proceed from a want of taste or discrimination, as in infants or in idiots, or from a corrupt taste, or an indulgence in a corrupt appetite. A longing for improper articles of food, however, often occurs in persons possessed of sound judgment, and may be occasionally regarded, not merely as the fickle wish of a whimsical invalid, but rather as a symptom of some functional disturbance, or of some peculiar condition of the system, and is not uncommon in chlorosis, pregnancy, and various species of mental emotion, &c. The substances longed for by those under these or similar circumstances, are often of the most indigestible, as well as disgusting quality, such as dirt of all kinds, coals, cinders, pieces of wood, paper, insects, small reptiles, &c. John Hunter, in his *Observ. on Diseases of the Army*, describes a longing desire to eat loam or clay, as an endemic disease among the blacks in Jamaica. It may be worth considering, whether such desires may not proceed from the unhealthy condition of the stomach itself, which, though not diseased in structure, may be impaired in function, and suffering perhaps from an excess of acid, or from the altered quality of its secretions, or from sympathy with some other organs in a state of disease or excitement, may labour under some peculiar irritability or uneasiness, which seeks for, and sometimes finds, a transient relief in the swallowing of earths, and various other matters, which are there sought for with an eager and indiscriminate and often a voracious appetite.

ART. II.—*Report of a Case of Fracture of the Pelvis, attended with Sloughing of the Urethra, and singularly extensive urinary Fistulae, cured by Operation after the lapse of one Year and a half.* By JOHN HOUSTON, M. D., M. R. I. A., Demonstrator of Anatomy, and Curator of the Museum in the Royal College of Surgeons in Ireland: Surgeon to the City of Dublin Hospital, &c.

[Read before the Surgical Society of Ireland.]

JOHN FORTUNE, aged 18, was admitted into the City of Dublin Hospital on the 8th September, 1833. Two days previously, while working on the Kingstown railway, he was squeezed between two waggons coming in contact when passing in opposite directions. He fell motionless on the spot, and fainted, so as to convey to the by-standers the impression that he was dead. On recovering from this state he complained of an agonizing pain in the region of the bladder, and upper part of the right thigh, which was greatly aggravated by the movements necessarily given to his body in shifting him from the place where the accident occurred to his lodgings. He slept none during that night, and on the day following experienced no abatement of the pain. He was bled, and had some opening medicine administered to him, but without the production of any, the slightest relief.

On admission into hospital, whither he was carried in great agony, the weakness exhibited by him was extreme. The penis, scrotum, and perineum, for several inches behind the anus were swollen and livid. The back part of the right hip exhibited the same ecchymosed condition. The only power he possessed over this limb was that of moving the toes; the member lay in any posture in which it was placed, but he was unable of himself to shift it therefrom. This motionless condition arose, however, from an apprehension of aggravating the pain which he laboured under, and not from any actual para-

lysis of the muscles, as he had power to a certain extent of flexing and extending at will all the joints of the left lower extremity. The right, or disabled limb, was of the same length as the left, and its toes lay pointed in the same natural direction. The foot admitted of rotation inwards or outwards; and in these motions the trochanter always took part,—lying in its natural place, and exhibiting the usual degree of projection. The least movement of the limb, or pressure on the trochanter or os pubis, was productive of a distressing pain, which was described by the patient as if darting through the upper and inner part of the thigh, in the situation of the adductor muscles. There was likewise considerable pain in the lower part of the abdomen; and the bladder, which had not been emptied since the accident, was over-distended with urine; pressure on this region aggravated all his sufferings, and the act of taking in a full breath, or of coughing, or straining in any way, was productive of the same effect. So far the symptoms were all evidently of such a character as to indicate, that whatever the real nature of the accident might be, the spine remained uninjured, the thigh bone free from fracture or dislocation, and the urinary bladder safe from rupture.

To prosecute still farther the examination, the patient was raised horizontally from the bed by two assistants, (though the sufferings produced thereby were such as nearly to deter from the attempt,) when a fracture was discovered, separating the os ischium from the os innominatum; by a slight lateral pressure on the most projecting part of that bone, its mobility was easily felt, and on every repetition of the movement a crepitus was audible. It was, of course, only when the body was raised off the bed that these latter symptoms became obvious. The precise extent or direction of the fracture could not, however, at the time be ascertained; though it was apprehended, from the pain caused by pressure on the trochanter, that the acetabulum was involved in the injury.

On this day, the second from the time of the accident, there

was considerable fever, indicated by quick pulse, thirst, heat of skin, white tongue, and confined bowels.

A large gum elastic catheter was passed into the bladder; considerable relief from pain was obtained from the discharge of the urine; the instrument met with no obstacle to its easy entrance; the urine was clear, and free from any admixture of blood. Leeches and stupes were ordered to the hypogastrium; a purgative draught immediately; and an anodyne at night.

9th. Slept little during the night; urgent calls to make water, which it became necessary to draw off every three or four hours, the evacuation each time being followed by much relief from pain; the abdominal tenderness less constant. The bowels were several times moved from the medicine; the passage of the stools caused much distress in the perineum and thigh. The swelling of the penis and scrotum somewhat reduced. The patient complained of numbness in the lower and back part of the thigh, like the feeling experienced in the fingers consequent upon pressure on the ulnar nerve. Feverish symptoms increased. Pulse 110.

11th. No sleep; urine drawn off every second hour; screams aloud with the intensity of the suffering attendant upon its retention beyond that period, and gets instant relief by its discharge; tolerates pressure of the abdomen without much complaint; considerable reduction in the size of the penis and scrotum; but a hard, red, and painful tumour has shewn itself in the perineum, extending from the root of the scrotum along the side of the anus, as far back as the coccyx; cannot bear to be moved; numbness of the thigh continues; pulse 84; tongue white and moist; thirst less urgent. Leeches, stupes, and poultices to the perineum.

13th. Great anxiety of countenance; pulse 100; tongue brown; flushes of heat, followed by remarkable prostration of strength, threatening dissolution; urgent calls for the catheter every two or three hours; the urine discharged is scanty, re-

markably foetid, and loaded with a thick, ropy, adhesive mucus. When the bladder is distended, the application of the hand over it aggravates the pain in the perineum and thigh; but if pressure be made on the organ after the urine has been discharged, or even during the time of its flowing through the catheter, no such disagreeable sensation is produced. A band-tied tightly around the upper part of the thigh gives some relief from pain. The numbness of the thigh continues; the ecchymosis of the penis and scrotum nearly all gone; the tumour of the perineum on the increase.

An incision was made into the perineal tumour, and some purulent matter discharged.

From this time the patient continued much in the same state, with several threatenings of dissolution, and with hourly demands for the catheter, until the night of the 23d, about the middle of which he fell into a sound sleep, and did not awake until morning, when it was discovered that the urine had flowed about the bed and floor, through the opening in the perineum. On examining this part, and extracting an ashy-white slough, which plugged up the passage, a large quantity of extremely foetid urine, mixed with pus, was liberated; an uninterrupted dribbling of this fluid followed. The unusual sleep, and cessation of demand for the catheter, was the result of an opening made in the urethra by the extension of the sloughing to that tube, and the freedom in the evacuation of the urine consequent thereon. That the urethra, and not the bladder, was the part opened became obvious subsequently, though at the time no certain conclusion to that effect could be arrived at, as the incontinent state of the bladder permitted a continual dribbling of the urine through its neck, with as much freedom as if some part of its walls had been laid open.

Wine, beef-tea, camphor, and opium were ordered.

26th. Since last report has had no occasion for the catheter; urine passes off without notice, and is all discharged by the perineum; pulse 96; tongue dry; appetite improved;

sleeps tolerably by opium. Two large sloughs have formed on the back. Was turned to lie on his face, and experienced much relief from the change of posture.

October 3d. Sleeps occasionally; no return of sinking: appetite good; no night sweats; sloughs detached from the back; sores granulating; sloughs occasionally fall into the opening in the perineum, which require removal to allow the passage of the urine; bladder regaining its power, for although the discharge is frequent, the patient is conscious of its approach; skin of scrotum excoriated, thickened, and painful, from the continual dribbling of urine over it; little abatement of pain in thigh. Several attendants are in constant requisition to shift his posture; for although he screams aloud with agony at every movement of the body, he nevertheless frequently solicits a change of position, in the vain hope of finding relief from a continued sensation of weariness, numbness, and pain in the thigh.

He cannot bear the pressure of a bandage around the pelvis, but finds some relief from the varied application of pillows under that region of the body.

Omit the bark; continue the nutritious diet and opiates.

Turned again on the back.

Oct. 9th. Has been worse for the last two days; did not sleep; had several returns of sinking; complained occasionally of chilliness, not amounting to rigor; in no position does the injured limb find ease. An attempt was made to place him on the left side, but that posture could not, for a moment, be tolerated.

12th. Bad rest; rigors every evening: complains of an oppressive sensation of weight over his whole frame, and pain in his loins.

When turned on his face to make an examination of the back, a deep seated abscess was detected in the right lumbar region, which, when opened, discharged a large quantity of extremely fetid, ill-conditioned matter. Much relief followed the operation; but, on the day following, he became very low,

had no sleep, and perspired profusely, notwithstanding that the discharge from the abscess was inconsiderable. Pulse 120; tongue brown and dry; face pale and sunken. By wine, quinine, and sulphuric acid, the perspiration was checked, though only to be replaced by a diarrhoea, which, however, in its turn subsided, after the administration of chalk mixture, with catechu and opium. He suffered little inconvenience from lying on the face, and acquired a habit of holding in his grasp, whether sleeping or waking, the outside of the disabled thigh, having found, from the first, that pressure in this part gave some relief to his sufferings. A paralytic state of the hand and forearm, the consequence of this long-continued effort, caused him to let go his hold, and at his own solicitation a tight band was applied in its stead. The power of motion in the hand was not regained for several weeks.

Nov. 8th. The sloughs on the back have all separated, and the sores look healthy. A hair cushion, with a circular hole to receive the buttock, was placed under the patient. Limentum calcis to the excoriated scrotum; wine; nutritious diet.

25th. Appetite good; tongue slightly furred; pulse 100; free from night-sweats or diarrhoea; disturbed as heretofore with pain in the thigh, which, however, is so far altered as to be principally felt at night, and scarcely at all during the day, except when the limb is moved. The abscess on the back has opened again, and is discharging profusely. The bladder has greatly recovered its power. The patient makes water, partly by the urethra, partly by the fistula, about twice in twelve hours. The desire to void it comes on suddenly, and he can then only retain it while the vessel is being handed to him. The urine is still foetid, and deposits, on standing, a tenacious, white, viscid sediment.

Within a few weeks from this period a manifest improvement in his general health took place; but, for months after, the pains produced by any movement of the body were nearly as excruciating as they had been in the first instance.

In January the sores on the back had all healed up. The fistula in the perineum, kept as open as possible by the occasional introduction of a bougie, gave tolerably free discharge to the urine, which had now nearly deserted the natural canal. About this time the patient had frequent exacerbations of fever lasting for three or four days, and in every one of which the urine assumed the qualities which characterized it in the commencement of the illness, and became clear and free from sediment on the subsidence of the febrile attack. In all such cases, the patient complained of pain and tenderness above the pubis, from which relief was obtained by stupes, mucilaginous drinks, &c. A catarrhal state of the bladder, most probably consequent upon the unnatural and imperfect evacuation of the urine, was considered to be the cause of these symptoms.

About this time a hard tumour, painful on pressure and, no doubt, a mass of callus, could be felt through the abdominal parietes, occupying the right brim of the pelvis, in the situation of the iliac vessels; and by the introduction of the finger into the rectum a similar tumefaction was discoverable, filling up the right side of the pelvis, and pushing the viscera of that region completely to the left. So extensive and prominent was this swelling, that the cavity of the pelvis appeared reduced to nearly half its natural dimensions.

In the month of March a small tumour formed slowly in the back, opposite the upper edge of the sacrum, and a little to the left of the mesial line. This tumour acquired the size of an almond; was painful to the touch, red and remarkable in the fact that it became full and tense during every attempt at voiding urine, and subsided again considerably after the discharge of that fluid. A puncture with a lancet gave vent to a small quantity of foetid pus, but the opening became in a short time a complete urinary fistula, discharging urine during every attempt at making water, and remaining comparatively dry in the intervals. The formation of this tumour was attended with little fever, and had not much effect on the ge-

neral state of the health. The natural passage through the urethra became daily more and more obstructed, and the opening in the perineum contracted apace. Ever since the first night of the discharge of urine by the perineum, no instrument could by any manœuvre be got into the bladder, either by the natural route of the urethra, or through the fistulous canal, notwithstanding that several attempts were made by some most experienced surgeons. The perineal space was now much diminished in size, on account of the projection towards the mesial line of the broken rami of the pubis and ischium, and the cicatrization and hardening of all the textures in the neighbourhood. Pressure with the finger on the seat of the perineal fistula caused pain; and its insertion into the rectum was productive of the same effect. A probe, or small gum-elastic catheter, introduced through this fistula, passed for several inches in the direction of the right side of the bladder, but never could be got to enter the cavity of that viscus. The prospects of the patient at this period were very bad, and no operation suggested itself as likely to render them more encouraging.

This state of things continued more or less until the latter end of April, when a new symptom presented itself. A pricking, as of a sharp-pointed body sticking in the flesh, at the top and inner part of the thigh, was continually felt by the patient on attempting to move the limb; and this pricking, after about a week's duration, assumed more the character of pain. In a little time further, a tumour formed about three inches below Poupart's ligament, accompanied with a most distressing pain and throbbing, and considerable fever. It was remarked by the patient, that his sufferings were always greatest at the times of voiding urine; and that at these periods, likewise, the tumour underwent a manifest enlargement. The only applications, by which the extreme pain was lulled, were very warm anodyne stupes. The ordinary antiphlogistic treatment having, however, failed in arresting the progress of the tumour, a

lancet was pushed deeply into it, without waiting for the occurrence of fluctuation, and some purulent matter was pressed out, with great relief to the patient. At first the fluid discharged consisted of nothing but pus, but in the course of a few days, it was observed to be mixed with urine; and at a period somewhat later, when the tumefaction had in a great measure subsided, and the tract of the abscess had assumed the characters of a fistula, clear urine unmixed with matter flowed from the orifice, and this only at the times of discharging the bladder in the natural efforts. In the course of some weeks, when the opening in the skin had contracted to a narrow circular hole, the urine flowed from it in a small, arched, limpid stream, which could be received in a vessel at a distance of several feet from the patient. Shortly after the establishment of this outlet for the urine, that on the back healed up, leaving a red, indented mark in its place. The healing process here did not, however, appear to have extended deeper than the surface, for at times the soft cicatrix became puffed up with a little urine whenever the bladder emptied itself, and if punctured gave discharge to a small quantity of that fluid, but healed up again in a few days.

During the greater part of the summer the patient was wholly confined to bed, varying in his state of health at different times from a variety of circumstances. All along he suffered pain in the right hip, and was not for a long time able to lie on that side. The limb, which always lay extended and closely adducted to the other, became gradually shorter than its fellow by about three inches, having the toes, as the shortening increased, more and more inverted. Ankylosis of the hip, in this posture, gradually took place, and was completed by the end of summer. The perfection of the ankylosis was followed by very considerable mitigation of the pain. The patient could then tolerate pressure about the trochanter and hip joint without making complaint. He bore being shifted and moved about in bed without pain, and could even lie occasionally on the unsound

side. The result of the healing on the form and motions of the hip joint, and on the dimensions of the pelvis, left no doubt that the fracture had traversed the cavity of the acetabulum.

The patient's life was on several occasions brought into jeopardy by fits of retention of urine, which came on without any new accountable cause, but which, under circumstances like the present, where no instrument could be got to reach the bladder to accomplish its discharge, and where the patient was already the subject of so many fistulous passages connected with that viscus, were peculiarly embarrassing. Fortunately, however, every one of these attacks was got over by bathing, stupefying, or other medicaments, without the necessity of having recourse to the knife. On one such occasion, when the usual plans had failed, strong pressure with the hand on the bladder, above the pubis, succeeded in emptying it, before actual paralysis had seized on its powers.

Each of these attacks, by perpetuating the patient's sufferings and increasing his debility, retarded convalescence, and, even when got over, left him afflicted with some new evil. After one attack, which lasted without urinating for nearly forty-eight hours, and in which the bladder mounted almost to the umbilicus, he was afflicted with incontinence of urine for better than a fortnight; and had urinary fever, rigors, night-sweats, and delirium. After others, where the absolute retention was not of so long duration, the sequelæ were thick foetid urine, great frequency in the calls to urinate, and loss of sleep and appetite. And in one instance, there were, in addition to these symptoms, a gleety discharge from the urethra, a scalding during the passage of the few drops which usually passed through that canal, and hernia humoralis of the right testicle. It was singular to remark the readiness and the frequency with which the urine, under these circumstances, changed from being natural and clear to a state in which foetid, and thick,ropy deposit, constituted its most prominent features. During all this time the urine continued to find its way by one or other of the

false routes which had been opened for its evacuation. At one time it was discharged through the opening in the back ; at another, through that in the thigh ; sometimes it would ooze through both these passages at the same moment ; and during the whole period of the patient's illness, never ceased passing, in greater or less quantity, from the fistula in the perineum. The readiness of its escape by the urethra appeared to be subjected to the same vicissitudes as that by the other channels : at times it flowed therefrom in a tolerable stream ; at others, again, it appeared to desert this course altogether. Two things, however, were obvious, that the calibre of that part of the urethra, anterior to the seat of the injury, was growing gradually smaller, for want of the natural cause of dilatation—a full stream ; and that the occasional introduction of a catheter, as far as it could be accomplished, was of service in widening the tube ; for, after every such operation the patient expressed himself satisfied that the water came out more easily and fully. Indeed, this was the only operation, with the exception of that of widening the perineal aperture, up to this period, ventured on for his relief.

The alternations of closure and opening of the fistulæ in the back and thigh exhibited some circumstances of difference.

In both cases, when about to close, the fistulæ became deserted by the urine, and suddenly dried up. The re-opening of the fistula in the back was always preceded by the formation of a small, soft, painless tumour, not bigger than a marble, from which, when punctured, the urine at once found exit, and continued to be discharged on every attempt to urinate ; the re-opening here always occurred on the same spot. The re-opening of the fistula in the thigh was in every instance accomplished by the formation of a phlegmonoid abscess, which gave rise to fever, pain, and tumefaction, and when punctured yielded nothing at first but purulent matter, but after a day or two permitted the escape of urine in admixture with the pus ; sometimes too, in this case, the orifice of exit was formed in new

ground, and the fistula appeared to have no connexion with that which had preceded it.

These fistulous passages, in making their way to the surface, must have passed out through the side or back part of the pelvis, but at what particular place, or in what exact route, we have not sufficient evidence to determine.

In this way did the unfortunate man pass over the winter, and five months of the summer, never free from suffering, and scarcely ever two days consecutively in the same condition. In the month of September some amendment began to dawn upon him. The fistulae gave less inconvenience, and the urine was principally evacuated by the perineum and urethra; his flesh became somewhat filled up, and he began to express a desire of getting out of bed. The first attempts which he made to accomplish this latter object were very discouraging. He could not adopt the sitting attitude—the natural way to have commenced the experiment—on account of the extended and ankylosed state of the hip; and when held up erect, so as to rest on the feet, he fell into a swoon, from which he only recovered by being laid again on the back. The circulating and other organs having contracted a habit of carrying on their functions in one position only, became incompetent to their proper discharge in any other; and many were the attempts made by this patient before he was able to maintain the erect posture for any length of time, even though propped up on each side by an assistant. On several occasions we were desirous of sending him, for a change, into the country, but his apprehensions of being seized with retention of urine, or some new dangerous symptom, made him loath to go away to any distance, and he was therefore allowed to remain in the hospital. During the fine part of the day he was frequently carried, with his bed, into the garden, which, as it gave him much gratification, no doubt contributed to his convalescence.

Up to November the condition of the patient continued, more or less, such as has been just described; but, from this

period, all the symptoms attendant on the fractures of the bones became every day less urgent, whilst those consequent upon the injury of the urinary passages assumed a more dangerous character. The fistula in the perineum became closed to a very narrow compass, in spite of every effort to keep it open ; the urethra refused transmission to the urine, which was consequently forced to make its way out of the back and thigh, and even these channels were only kept free by repeated burstings. The patient became emaciated and hectic ; all his secretions emitted an urinous odour ; and he had night-sweats, shiverings, and all the distressing symptoms usually attendant on extensive urinary disease. What, under such circumstances, was to be done ? No instrument could be got along the urethra further than the arch of the pubes, to serve as any certain guide, by which a passage might be opened to afford a free outlet for the urine ; and the perineum was so narrowed, distorted, and shrivelled up, and so hidden by the ankylosed thigh, as to put out of question the propriety of making any chance incision into that region in the hope of opening the urethra. And in addition to the danger and difficulty attendant on any such attempt, little more than temporary relief could at best have been anticipated from the most favourable result of such trial, as the subsequent healing of the incision would have only left the parts in the same predicament as before, unless the canal of the urethra were in the mean time re-established. It was in contemplation, at one time, to have tapped the bladder above the pubes, and to have given the man the alternative of wearing a catheter in the opening for the remainder of his days, rather than let him die in his present miserable condition ; but even for this operation no opportunity presented, as notwithstanding the proneness of the bladder, on former occasions, to become over distended with urine, it appeared, at this period of his illness, to have become so much diminished in size, as never to rise by distention above the level of the pubes. With a view to the performance of this operation, trials were

even made to fill the organ by injections of water through the urethra and perineal fistula, but without success, as the fluid, when thus forced in, either returned by the urethra, or passed off by the collateral sinuses, and, of course, unless during the state of plenitude of the organ, no such operation upon it could have been attempted.

The question of tapping by the rectum for his relief was met by the same and other, even more insurmountable, objections.

During this embarrassment, I one day, when exploring the cavity of the rectum with my finger, happened to discover through the coats of the gut, in the situation of the membranous part of the urethra, a soft pit or sac, of the form and size of the mouth of a thimble. The depression was very palpable, being soft in the centre, and surrounded by a hardened ring. It was also the seat of pain when pressed with the point of the finger. It occurred to me, at the time, that this cavity might be, perhaps, a sort of reservoir into which the urine flowed directly from the neck of the bladder, and from which it subsequently passed off through the several tortuous fistulæ opened for its evacuation. It also appeared probable, that an incision from the perineum into this space might be followed by some good result.

In consultation with Doctor Colles, Doctor Cusack, and my colleagues in the hospital, an operation of this nature, and founded on these views, was approved of.

On the 22d of January, 1835, an incision was accordingly made, as for that of lithotomy, in the left side of the perineum, regardless of the original fistulous orifice, which lay to the right. In the first part of the operation, the skin and cellular membrane was divided; and then, with the finger of the left hand in the rectum, to guard that intestine from being wounded, the knife was pushed straight inwards in the direction of the sac. A hard cartilaginous structure, which lay in front of the cavity aimed at, and which was only partially divided by the

knife in its entrance, was then cut across by a probe-pointed bistoury, in the direction of the tuber ischii. The opening thus made of the structure immediately bounding the sac was sufficiently wide to admit the end of the finger, to which it felt as a tight ring. This aperture was the full depth of a finger from the surface, and as wide as the approximated bones bounding the perineum would safely admit of; the space between the rami of opposite sides being so narrow as barely to permit the introduction of the little finger. A probe, passed along the original fistulous tract, was felt by the finger in the sac, thus affording a direct proof of the connexion that had been calculated on as existing between that cavity and the deranged urinary passages. No instrument could be got by the wound into the bladder. There was no loss of blood from the operation.

A large bougie, open at the extremity and wrapped round with lint, was introduced to the bottom of the wound, and fastened to the inside of the thigh. The application of the lint became necessary, as the instrument, when introduced naked, was shot out again with much force, by the elastic pressure of the flesh acting on its smooth surface.

For some days, all went on well: the greater part of the urine was discharged through the bougie; the remainder made its way along the side of that instrument. There was little febrile excitement from the operation.

On the 25th, the fourth day, we were surprised by hemorrhage. On the evening of that day, there was some occasional oozing of blood from the wound and urethra. During the night, the quantity increased to a frightful amount, and consisted of black coagula mixed with urine and ropy mucus, repeated at intervals with straining and a sensation as of voiding urine. The man became faint and pale from loss of blood; the pulse was so small and quick as to be countless; the limbs were cold; there was insatiable thirst; and vomiting of every thing swallowed.

By appropriate treatment, the hemorrhage gradually lessened, and in the evening of the succeeding day had ceased altogether, not again to return. This hemorrhage,—appearing at so late a period after the operation, so suddenly, so profusely, and yet so readily checked, without shewing any tendency to recurrence,—I have never been able satisfactorily to determine the source of.

On the 27th, the pulse had come down to 90; there was comparatively little thirst and no vomiting; he had enjoyed sleep, and looked much better; he voided urine, at will; but could not restrain it a moment, when the feeling of desire for its discharge came on. This fluid all flowed by the wound; none came by any other passage.

Early in February, a little urine began to flow from the urethra. The fluid became clear and free from sediment on standing, and the bladder retained it for hours. The swelling and hardness about the fistulæ in the back and thigh had greatly subsided, and the discharge of purulent matter from these apertures had nearly ceased. The patient had also improved much in flesh and strength. The largest sized bougie was introduced daily to free the wound and keep it open; the addition of a roll of lint was no longer practised, on account of the pain caused by it, and the obstacle which it gave to the entrance of the instrument.

On the 15th February the introduction of the bougie was attended with a new circumstance. The resistance which it usually experienced on reaching a certain point was no longer felt, and the instrument by a gentle pressure was made to pass in for more than half its length, without the production of any additional or new pain. It was at first supposed, from the ease with which it passed onwards, that by mistake it had been introduced into the anus, but this conjecture was soon shewn to be incorrect by an inspection of that orifice. It was then suggested that it had perhaps got between the bladder and rectum, or even into the cavity of the latter, through some fistula or false passage, but on examining with the finger in the gut, the instru-

ment could no where be felt. As a new experiment, the bougie was withdrawn and a gum-elastic catheter introduced in its stead, when unexpectedly a large quantity of clear urine flowed through its canal. The instrument had gone into the bladder by the natural orifice.

The success of this experiment, which became now equally certain at every trial, opened new prospects. A direct entrance into the bladder was the object all along to be desired; and one especially, which, like the present, might by possibility be made available for the purpose of re-establishing the natural passage, was, above all others, felicitous.

In explanation of the entry of the instrument into the bladder at this particular period, and not at any former, we may venture to suppose, that by the contraction of the artificial sac in front of the neck of the bladder, a straight sinus for the transmission of the urine was formed out of the bag-like cavity which existed previously and for a time subsequent to the late operation; and that by the smooth walls of this sinus the point of the bougie was conducted directly into the orifice of the bladder which lay at its posterior extremity.

With a view of connecting the original urethra with this new passage, I commenced dilating, with a small silver catheter, that part of the tube in front of the perineum, which had become narrowed by inflammation and disuse, and after several days' trial, was fortunate enough to find the point of the instrument came in contact under the pubis, with the bougie which I had previously passed through the perineal wound into the bladder. Having succeeded thus far, and practised the operation for a few days, gradually enlarging the catheter, I substituted, on the 22d of February, a long, widely-grooved, silver director for the perineal bougie; and on the groove of this instrument succeeded in conducting the silver catheter the entire way along the urethra into the bladder. This step being gained, my next object was to introduce in the same way a gum-elastic catheter, which, by admitting of being left for a longer time in the passage, possessed

an advantage over the silver instrument. In this I likewise succeeded, though there was not so much ease or certainty in manipulating its point, or discovering when it came in contact with the director, from the absence of the resistance and metallic sound, which served in the other case as guides. The instrument was introduced in this way every morning, and left in the bladder for an hour or two.

On the 27th—five weeks from the day of the operation, the report of the case was very encouraging. He made water at nearly natural intervals, and most of the fluid came in a full stream by the urethra. Indeed, except immediately after the widening of the perineal aperture by the introduction of the director, nearly all the urine came away by the natural passage. Pressure with the finger on the perineum, so as to obstruct the orifice of the fistula, promoted the evacuation by the urethra.—He was up and walking about on crutches; had no pain in moving the limbs; the fistulae in the back and thigh had quite healed up, and were free from any feeling of uneasiness; he had recovered his flesh and looks; ate heartily; and slept well, without having occasion to make water from bed-time till morning.

On the 6th March, I made the last step towards the restoration of the urethral canal by effecting the introduction of a middle-sized gum-elastic catheter into the bladder, without the assistance of the director. The main cause of the difficulty to the introduction of the instrument lay in the crookedness of the urethra in its passage through the perineum, arising from the projection of the rami of the pubis and ischium towards the left side, which pushed the canal obliquely in that direction.

From this period I possessed full control over the bladder, having it in my power to introduce any instrument at pleasure. The urine was all discharged by the urethra; but, solicitous about keeping the perineal aperture free, to have it as a safety tube in case retention of urine from any unforeseen cause should

arise, I endeavoured to widen it almost daily. No such occurrence, however, took place, and the man left the hospital on the 20th April, in good health, capable of voiding urine in as good a stream as he had ever done, and only inconvenienced by lameness arising from the shortness and stiffness of the limb consequent upon the ankylosed state of the hip. He was immediately taken into employment, as a bell-ringer, by the Railway Company in whose service he had been disabled. I this day, June 27th, saw him at his post, in the enjoyment of full health; without any perineal fistula; without any, the least feeling of derangement in the urinary passages or bladder; and walking about actively and steadily with a cork-soled shoe to equalize the length of his limbs, but un-aided by either staff or crutch. The recovery from such injury of the bones of the pelvis, as existed in this case, was no doubt altogether due to the patient's youth and good condition of body; but the cure of the secondary affection, viz. the interruption to the passage of urine by the urethra, and its evacuation through so many unusually false channels, together with the co-existing urinary fever consequent thereon, is altogether attributable to the operation practised upon him, founded on an accurate observation of the true state of lesion in the perineum and urethra. The detection of the little sac in front of the neck of the bladder, and from which the urinary fistulæ emanated, led to the subsequent and, as the result proved, appropriate treatment. I must acknowledge that, in performing the operation alluded to, I calculated on little more than temporary relief to the patient, especially when I found that, on its completion, I did not succeed in getting the bougie through the new passage into the bladder; and I cannot avoid here expressing my admiration of the tact and foresight of Professor Colles, who, in reply to an expression of my apprehensions on this point, prognosticated what actually occurred subsequently, "that, after some time, the instrument would be likely to follow the direction of the stream into the bladder."

The dilatation of the atrophied and contracted urethra, which I set about on the discovery of the passage through the perineum into the bladder, was accomplished with more expedition, and ease to the patient, than I had anticipated : by a little practice in the introduction of graduated instruments, one of middling size was in a few days got so far as to reach with its point the newly established canal in the perineum. It might be supposed, that being arrived at this place little difficulty would have attended its farther and complete course into the bladder ; but such was not the case ; the diversion of the urethra from its natural line by the projection against it of the broken rami of the pubis and ischium, together with the roughened and unequal walls of the sinus in which it terminated, so turned aside and entangled the point of the instrument that it could not be conducted further. Even the introduction of the straight bougie through the perineum required a particular manœuvre for its accomplishment. As to the subsequent operation of employing a silver director to conduct the point of the catheter through the new sinus into the bladder, though I believe it to be a measure which has not ever been spoken of by writers, yet I must acknowledge it does not originate with me. It is an operation which has been practised, and publicly spoken of in lectures, by some eminent practitioners in this city, but which, like many other good points in surgery emanating from them, might never, as far as they are concerned, have reached the public eye in print.

I shall only remark, farther, that after accomplishing the introduction of the catheter, without the aid of the director, the canal still retained the same crooked course in its passage round the projecting bones ; but that by a particular manœuvre, which consisted in directing the point of the instrument, at this place, a little to the left, and subsequently turning it back again towards the mesial line, it was conducted to the bladder without difficulty. It may, however, be considered that a period of two months does not afford sufficient time for asserting the

establishment of a complete and permanent cure; and as I shall have occasion to see the man, from time to time, for the purpose of introducing a bougie, I shall take a future opportunity of reporting farther on his condition.

ART. III.—*Observations on Diseases of the Stomach, their Sympathies, and Complications.* By Langston Parker, M.R.C.S.L., (Birmingham.)

THERE are certain affections of the stomach, which are sometimes independent of, and sometimes accompanied by inflammatory action, which have been appropriately termed by Dr. James Johnson morbid sensibility, and by the French pathologists, "*névroses des viscères.*" Much diversity of opinion exists as to the nature of these diseases and their treatment; some with "Broussais" and the pupils of his school attributing the whole class to gastric inflammation, whilst others, overlooking entirely the complication of such morbid action with the disease, condemn as highly detrimental the recourse to antiphlogistic remedies for their cure. The sources of decayed or impaired digestion are various, dependent either upon the undue quality or excessive quantity of the food taken, or upon disease in the tissues or secretions of the stomach itself. In addition to the proper coats of the stomach, each of which, in a state of disease, may be the source of impaired digestion, the vascular and nervous systems entering into the composition of the organ may be in this, as in all other parts, separately the seats of disease, which though they cannot be said strictly to be independent of each other in their morbid actions, nevertheless in certain states so far become so as to render the affection of one order of parts the predominant feature of the disease.

I shall illustrate these diseases by a selection of cases, making those deductions from them, as I proceed, which will appear most likely to be of practical utility.

Morbid sensibility of the stomach and intestines, gastralgia or enteralgia, are terms made use of to designate a state of disease in which the mucous surfaces of the alimentary canal are painfully sensible to impressions which in a healthy condition they do not perceive; these impressions, by the exaltation of nervous sensibility which accompanies them, materially deranging the functions of those organs in which they are seated, and by their reaction upon the economy at large, producing sympathetic diseases of great variety and importance.

Morbid sensibility may occur either as a primary affection or succeed to attacks of an acute inflammatory character, whence it is apt to be mistaken for a recurrence of the inflammatory disease.

CASE I.—May, 1834.—*Simple morbid Sensibility of the Stomach.*

A delicate lady, aged 23, consulted me for a painful affection of the stomach. Its principal features consisted in pain of a most acute character after taking food of any kind, whether solid or fluid, accompanied by acid eructations and slight constipation. She was much emaciated since the commencement of her disease, which has been of three weeks' duration, had profuse night perspirations, with cough, and was remarkably depressed in spirits. The chest, examined by auscultation, afforded no evidence of disease, the epigastrium slightly sensible to pressure. She was confined to farinaceous diet, and ordered to take one-sixth of a grain of morphia with three of rhubarb and three of aloes twice a day, with two minims of hydrocyanic acid in camphor mixture. These remedies were persevered in for a fortnight. The cough and pain left her, she was enabled to take other kinds of food without inconvenience, and soon recovered her usual degree of strength and spirits.

CASE II.—May 26, 1834.—*Simple morbid Sensibility of the Stomach, with slight sympathetic Affection of the Organs of Respiration.*

A lady consulted me for a painful affection of the stomach,

whose features were precisely the same as those described in the preceding case. I had attended this lady fourteen months before for an acute inflammatory affection of the stomach, and her former disease having been ushered in by long-continued gastric derangement of the same character as that under which she is now labouring, she became alarmed, and applied in order to have the recurrence of the former disease prevented if possible. The same plan of treatment was adopted as in the preceding case, and farinaceous ~~and~~ was enforced.

29th. The medicines, which at first gave great relief, have ceased to do so. The patient's whole state indicates the greatest weakness; her countenance is pale, the tongue white and flabby, profuse night perspirations, with cough and frothy expectoration. (The chest, examined by auscultation, affords no evidence of disease.) The appetite is bad, and whatever is taken produces great pain, which is confined to a small surface about the size of a shilling in the epigastrium, which pain is not increased by pressure. The food is not vomited, and the pain never entirely absent. The acetate of morphia, combined with rhubarb, was continued, and a blister applied over the epigastrium. She pursued the plan laid down for about ten days, at the end of which period she was quite well.

Remarks.—The two cases which I have just detailed, are examples of the simplest forms in which morbid sensibility is met with; its chief feature consisting in mere exaltation of the sensibility of the mucous surface of the stomach, commonly confined to a small circumscribed portion, upon which the patient will commonly place his finger as the sole seat of his distress. The constitutional disturbance attendant upon these forms of the disease is sometimes very great, and if long protracted, or badly treated, the mucous surfaces of other parts soon take on the same degree of morbid action, and give rise to a disease, complicated in its nature, extremely obscure in its history, and requiring very great discrimination and delicate management. The mucous surfaces of the bronchial

tubes are those which generally first become affected. The two cases already quoted afford examples of this in a minor degree. I shall adduce one or two, where the degree of gastric irritation being greater, we find the sympathies of the respiratory mucous surfaces still more marked.

CASE III.—*Morbid Sensibility, complicated with sub-acute Inflammation of a small Portion of the mucous Membrane of the Stomach ; sympathetic Affection of the Organs of Respiration.*

M. W., a delicate man, 32 years of age, subject for the last six months to pain after taking food, which is occasionally rejected by vomiting.

Present state, July 3, 1834.—Anxious cast of countenance, cold skin, hurried respiration, with constant cough, and expectoration of frothy mucus. (Chest examined by percussion, and auscultation apparently healthy.) Great tenderness in the epigastrium upon slight pressure, confined to a small surface. Food constantly rejected by vomiting, accompanied by great pain. Tongue coated, papillæ red and enlarged, particularly at the point and edges. Pulse hurried and bounding in its beats, but not intermittent ; urine high coloured and scanty ; feet and hands cold. He was ordered six leeches to the tender spot in the epigastrium, to be succeeded by a blister, rhubarb, and the acetate of morphia, with hydrocyanic acid ; farinaceous diet.

7th. All the farinaceous food has remained, and does not create pain since the application of the leeches and the blister. His whole state indicates great weakness ; the cough is gone ; the pulse has lost its bounding and irregular action, is full and soft, but frequent.

10th. Slight returns of pain at times after taking food, which the medicine invariably relieves. In all points much improved.

15th. Perfectly well.

This case illustrates very clearly the progress of the

disease if unattended to. The patient, who at first merely suffered from pain after taking food, at length is unable to retain it, the stomach having become so irritable as to reject it by vomiting. Two important symptoms are here added, which were absent in the two first cases, viz. epigastric tenderness, and vomiting. With regard to the first, considered as an isolated symptom, it is extremely deceptive, and worthy of little attention, since it exists in many cases to the greatest degree, where there is no reason to suspect any inflammatory action or organic disease, and is absent in many others, where every other symptom indicates the presence of both. I shall presently adduce cases in support of both these opinions. I believe in cases like the present it indicates congestion, a sub-acute inflammatory action, confined to small spots of the mucous membrane. In a subsequent part of this paper I shall enter into this more fully, the opinion appearing to acquire great support from the experiments and observations lately made by Dr. Beaumont. Constant vomiting of food after meals, accompanied by pain, and such symptoms as those observed in the preceding case, leave little doubt that the morbid sensibility is dependent upon, or complicated with inflammatory action. The next case exemplifies a still more aggravated form of disease, evidently complicated with acute inflammation.

CASE IV.—*Morbid Sensibility with acute Inflammation; sympathetic Affection of the Organs of Respiration.*

A lady, some months since, three days after parturition was carried out in her chemise, and laid upon the grass, in consequence of her house taking fire. Since then she has been constantly troubled with acute pain after taking food, which is constantly rejected by vomiting.

Present state, five months after the exposure:—great anxiety of countenance; extreme weakness; constant pain in the stomach, increased by pressure to agony; cold skin; small quick pulse; relaxed bowels; stools dark and offensive;

cessant cough, with abundant frothy expectoration. (Chest examined by auscultation and percussion, apparently healthy.) Under a treatment composed of local depletion, blisters, the acetate of morphia, and hydrocyanic acid, this patient speedily recovered.

I have now given examples of two forms of stomach disease, the first residing, probably altogether, in the nervous capillaries of the stomach, and exemplified in the two first cases; the second in which long continuance of the affection under this form had ultimately produced congestion, or acute inflammation. I shall now bring forward two examples where morbid sensibility has succeeded to acute inflammatory diseases of the stomach and alimentary canal.

CASE V.—*Gastritis succeeded by morbid Sensibility.*

I was suddenly summoned on the evening of April 15, 1833, to visit a lady suffering from acute pain in the epigastrium, unable to bear the slightest degree of pressure, stomach so irritable as to reject every kind of aliments or medicine taken; great heat of skin, thirst, headache, constipated bowels, cold feet, with frequent, sharp, and hard pulse. The matter rejected by vomiting was intensely sour, whatever was taken instantly returned in an acid form.—This lady had for some months previously been subject to pain after meals, with fulness and flatulence, irregular state of bowels, alternately relaxed and confined, fetid and acid eructations, with epigastric tenderness, cold feet, and occasional pain in the head. Ordered twelve leeches to the epigastrium, succeeded by a blister, total abstinence, during the disposition to vomit, except from small quantities of orange or lemon juice.

8. Hyd. sub. gr. vi.

Pul. opii. gr. ii.

Conf. arom. q. s. Ft. pil. vi. statim sumendæ.

To take half a drachm of the ponderous carbonate of magnesia and ten grains of columbo powder, every succeeding two hours, in mint water, until the bowels are affected.

By the 20th, the symptoms were so far subdued as to enable the patient to retain, without inconvenience or nausea, any mild food. The pulse became quiet; the skin cool; the tongue moist and clean; and the bowels acted regularly without medicine, but the food now taken, (24th,) however mild, produces the most severe paroxysms of pain, which continue for some hours after each meal; it is not accompanied by vomiting, or epigastric tenderness, and there is no evidence of the remains of any inflammatory action. I recommended that the diet should be confined to farinaceous food and jellies, and ordered the acetate of morphia with rhubarb, and hydrocyanic acid. By the 27th all uneasiness had disappeared, and any plain food was taken without pain. The remedies, which had afforded vast relief, were continued for a few days, and no return of complaint was experienced.

Remarks.—This case shews that occasionally there is a period in acute and sub-acute inflammatory diseases of the stomach and bowels, at which the inflammatory affection subsides, and all the symptoms which characterize and accompany it disappear; but still the pain attendant upon the inflammatory action does not subside, and in many cases becomes actually more acute as the inflammation disappears. This appears to arise from the excited sensibility of the mucous surface, consequent upon the diseased action; the increased vascular action subsiding, and leaving the nerves of the part still in a state of morbid irritability. This recurrence and increase of pain, after all the symptoms of inflammatory disease had disappeared, is particularly liable to be mistaken for a return of the original affection, and we cannot be too careful in examining the symptoms of the secondary complaint, since if it be merely nervous, a return to the first mode of treatment would materially aggravate the state of the patient. The vascular and nervous tissues entering into the composition of all organs, may be separately the

seats of disease, and though long-continued disorder of one necessarily produces morbid action in the other, still daily experience convinces us that the nervous tissue of parts may be the seat of irritation, which does not materially affect the functions of the vascular system with which it is so nearly allied. This case and the following exemplify at what period antiphlogistic remedies are to be discontinued in such cases, and others employed.

CASE VI.—April 14, 1834.—*Morbid Sensibility, succeeding to inflammatory Affection of the Stomach.*

I was desired to see a lady, 35 years of age, who was suffering from acute pain in the epigastrium, accompanied by constant sickness; full, frequent, and sharp pulse; constipated bowels; dry, coated tongue, with great heat of skin. By a perseverance in local depletion, which was employed daily till the 18th, the affection yielded. On May 3rd, there was no evidence of the slightest degree of inflammatory action present, but still all kinds of food produce great pain, warm fluids the most acute of all. The tongue is clean and moist; the skin cool; and the pulse quiet and soft. There existed a slight tendency to constipation, which always aggravated her pain. I recommended a mild, nutritious diet, to consist of farinaceous food or jelly principally, and ordered one-sixth of a grain of the acetate of morphia with four of rhubarb, three times a day. In a short time my patient perfectly recovered.

I now proceed to notice a severe form of functional derangement, accompanied by vomiting, severe pain, and pyrosis, and to offer some remarks upon what I believe in such cases to be the most successful plan of treatment. It is impossible, or at least difficult, to offer any classification of such diseases as I am now considering, but the cases detailed in this paper will offer types of almost all the important forms of stomach disease, which are interesting to the practitioner.

CASE VII.—March 6, 1832.—*Gastrodynia.—Pyrosis.*

I was consulted by a lady, for a disease characterized by the

following symptoms. Intense heat in the stomach and throat, with pain so great on taking even the simpler forms of food, that she was unable to do so more than once in the twenty-four hours. The affection had commenced, some months back, with slight uneasiness after meals, and had been progressing till now in spite of varied medical treatment. The long periods of abstinence from food, and the imperfect digestion of what little was taken, had reduced my patient to an extreme degree of emaciation, her weakness was great, and she walked with much difficulty. The local pain was accompanied by regurgitations of sour fluids and gases ; whatever was taken by way of support was generally vomited intensely sour. The bowels were constipated, which always added to the existing complaints ; there was hardly any tenderness on pressing the epigastrium, but this region appeared rather full when carefully examined. Every kind of medicine hitherto taken had increased the pain equally with aliment.

A blister was ordered to the epigastrium, and half a drachm of the ponderous carbonate of magnesia, prepared by Henry, of Manchester, was given every four hours, combined with ten grains of columbo powder, and the diet was limited to the farinaceous food, made by Hards, of Dartford.

8th. The first powder had eased the pain ; to-day there is much less, the food had not been vomited and had given no pain. No action upon the bowels.

9th. Bowels acted upon three times. All the symptoms ameliorated.

11th. Still improving. Animal broths and chicken are taken with tolerable comfort, but the bowels not having been acted upon, and the head in consequence affected, I ventured to prescribe some aperient medicine, of a character rather more active, still combining it with the carbonate of soda and magnesia. The aperient had produced so much pain that it was obliged to be laid aside. The powders, which invariably gave relief, were again taken, with a wine glass of the compound

decoction of aloes, and two drops of hydrocyanic acid, three times a day.

16th. The medicines act sufficiently, and cause no pain. Boiled mutton and chicken are taken with but a trifling degree of inconvenience. The tongue is clean ; she has gained flesh and strength.

Remarks.—It is evident on examining the history of this case, that its origin is to be traced to morbid irritability of the nervous capillaries of the stomach, and we find the secretions of its follicles and lining membrane secondarily becoming disordered. As the secretions of all parts go on under the direction of the nerves supplying them, it follows that they can only remain healthy as long as the secreting organ is supplied with its due proportion of nervous influence in its normal physiological state, and when this is impaired or decayed, is in excess or diminution, is over excited or not sufficiently sensible to stimulus, a corresponding condition of morbid secretion is the consequence. After long-continued irritability of the stomach, of which pain after meals is at first the only symptom, we have obstinate pyrosis, and the moment the pain begins the glairy acid fluid will begin to run from the mouth ; this I have commonly seen. In some cases there is such a disposition to the formation of acid on taking food, from the defective quantity, or morbid quality of the secretions of the stomach, that every article of diet, whether solid or fluid, is either rejected in a perfectly acid state, or constantly regurgitates into the mouth fluids so sour as almost to disorganize its, lining membrane. This action from time to time upon the coats of the stomach at length renders it so sensible, that it is unable to bear either the impression of food or medicine, and the patient, if not speedily relieved, would soon fall into a state of disease from which he would with difficulty recover. The first step in the treatment of these forms of disease is to correct the morbid secretions of the stomach, and for this purpose, no medicine is so beneficial as Henry's ponderous car-

bonate of magnesia, combined with columbo powder, and administered in the way I have directed ; a sixth or eighth of a grain of the acetate or muriate of morphia may be added, or from ten to twenty minims of the liq. opii sedativus, dropped into the vehicle in which it is administered. I am convinced that every thing of a more active character that is employed before the secretion of acid is corrected, and the stomach rendered less sensible to impression, only aggravates the disease and renders the recovery longer and more tedious. The second step in the treatment consists in endeavouring to remove the disposition to the formation of acid ; this I shall exemplify in the further detail of this case.

March 29th.—The pain still continues in a milder form, and invariably comes on after taking a mixture of aliments at dinner. The medicines at first prescribed invariably relieve the pain when it occurs, probably by merely correcting the acid secretions which cause it. I ordered the acetate of morphia now to be taken in doses of a sixth of a grain, three times a day, combined with four of rhubarb ; and the powders to be taken occasionally in the event of an attack of pain and acidity.

April 18th.—Since the last report there has been no pain, excepting on one day, when at a dinner party she ate freely of mixed food and green vegetables, and drank a glass of sherry ; immediately after the meal, sudden swelling of the stomach took place, with pain and vomiting of sour fluids. In order perfectly to restore my patient, I limited her to Hard's farinaceous food, with milk or without, for breakfast and supper, and common hasty pudding for dinner, which was afterwards changed to any one species of animal food, without vegetables. At the same time the ammonio-tartrate of iron was taken in doses of four grains, three times a day, with rhubarb and morphia. Under a steady perseverance in this plan, my patient perfectly recovered health and spirits.

Remarks.—In cases like the present, accompanied by the

predominating symptoms of pain and acidity, the attacks are exceedingly liable to recur, unless the patient can be persuaded to persevere in a strict dietetic regimen, and also in medical treatment. The effects, i. e. pain and acidity, are soon removed by an appropriate plan of treatment, as is well marked by the detail of this case from the 7th to the 16th of March, at which time my patient fancied herself well, but the morbid irritability of the gastric nerves which causes it, is not so soon or so easily cured. As long as they are kept free from impression, by having the morbid secretions corrected, or are not irritated by an over-stimulating diet, the patient is tolerably easy, but the moment one is discontinued, or the other indulged in, the attacks of pain come on with as much violence as at first. This case well illustrates the evil of a mixed diet, in cases of morbid irritability like the present, evidenced in the reports of the patient's state on March 29th, and April 18th. Persons will remain tolerably easy under any one article of food, even if it be rather of a stimulating kind, but a mixture invariably produces a return of suffering. We know from the researches of Prout, Tiedemann, and Gmelin, and Dr. Beaumont, that the gastric juice during digestion contains free acetic and hydro-chloric acids, and that these acids are furnished in greater quantity, in direct proportion to the more or less stimulating qualities of the food; under a mild farinaceous diet, the acid is hardly to be detected. It is the impression of stimulating food upon a morbidly sensitive surface which gives rise to the formation of so great a quantity of acid, which when formed reacts upon the mucous coat and produces pain; we have certainly cases of disease in which the stomach experiences pain merely from the impression of food, such are cases 1 and 2, but the one under consideration appears to derive additional mischief from the presence of its own morbid secretions, for the moment they are corrected, and the acid neutralized, the patient is for the time free from pain. Our plan of treatment consists in

removing all the sources of irritation, in correcting the morbid secretions, and rendering the nerves less sensible to impression. The two former objects are to be accomplished by diet and medical treatment, such as I have recommended in the detail of the case. For the latter purpose I have tried nothing more efficacious than the combination of morphia with the salts of iron, at the same time having occasional recourse to the alkalies. The farinaceous food made with milk and lime water into gruel or puddings, is exceedingly serviceable. The bowels, which are inclined to constipation in most cases, may be regulated by small doses of the ponderous carbonate of magnesia in some bitter infusion of cascara, or orange peel, to which still should be added some sedative, of which the liquor opii sedativus is the best; the tincture of hop or hyoscyamus may likewise be employed, but as far as my experience goes the first is the best.

The sympathetic affections of other organs, whether functional or organic, which are called into action by diseases of the stomach are exceedingly variable, and are most commonly seated in the lungs, the heart, the kidneys, or the brain. Functional affection of the brain, as regards the exercise of the intellectual faculties, producing despondency, impaired judgment, and mental excitement, is a disease well known as a result of these, under the term hypochondriasis. Accompanying functional affection of the brain, as far as that part of it devoted to the intellectual faculties is concerned, we have the same species of derangement extending to the nerves of the special senses, producing false impressions both upon the eye and ear. The nerves here partake of the same morbid action as those of the stomach, and convey false impressions to the brain, and in the second instance this latter organ does not receive the impressions which are transmitted to it correctly, but judges of them in an erroneous manner. The point of commencement of this general state of nervous excitement will, I believe, be most commonly found to be in the stomach; at least in the present in-

stance I have only to do with it as far as this organ is concerned, and we shall find it aggravated or allayed in proportion to the mitigation or increase of the stomach disease. It may or may not be accompanied by vascular excitement. The following case is a remarkable illustration of these points, and shews the nature of the disease and the plan of treatment.

CASE VIII.—November, 1834.—*Gastrodynia, with Hallucinations. Disposition to Suicide.*

R. V. applied to me some months since, with uneasy sensations in the stomach, worse after meals, but constantly distressing him; he had occasional vomiting, distention, acid eructations, and slight tenderness in the epigastrium. He received little benefit from medicine, but was so far relieved by leeches and a blister, that he returned to his occupation, fancying himself well. I was suddenly summoned to him on November 25th, and found him labouring under great mental uneasiness, accompanied by pain in the head, heat in the forehead and temples, acute pain in the epigastrium, which the patient could cover with his finger, scarcely aggravated by pressure, frequent vomiting of sour fluids, pinched and anxious countenance, cold skin, small, frequent pulse, tongue coated and red at its point and edges. He has never been free from uneasiness after his meals since my first attendance, but the paroxysms of pain now succeeding a meal of solid food are terrible, till it is rejected by vomiting. His nights are restless, and if he sleep at all, he is tormented by dreams of a most extraordinary character, intensely vivid and distinct. In the waking state he is visited by hallucinations of all kinds, the most common of which is a black bird, which, flying against his head with great force, produces, as he imagines, his headach. In the day, the desire to commit suicide is almost irresistible, and his wife is obliged to remove all dangerous instruments from his presence.

I confined him to farinaceous diet; ordered four leeches to each temple, and gave him—

Infus. Cascarillæ 3vii.

Magnes. Carb. Pond. 3ii.

Tinctur. Aloes. 3i.

Liq. Opii. Sedat. 3i. m.

Cept. cochlear. iii. magna 4tis horis.

27th. No hallucination the night succeeding the leeches. Restlessness and disposition to suicide less.

28th. To-day, most injudiciously dined on animal food, which was followed by a return of intense pain and vomiting. The pain confined as before to a small surface, and not accompanied by tenderness in the epigastrium on pressure :—

Emp. Lyttæ regioni epigastricæ. Cont. med.

December 2nd.—A return of the hallucinations the night succeeding the meal of solid food, but not since. No return of pain, sickness, or vomiting; the tongue cleaner, and moist; the same medicines were continued, changing the carbonate of magnesia for thirty minims of nitro-muriatic acid.

4th. Still improving. Some distention after taking food, but rarely any pain, which has almost left him. Less despondency; the nights are restless, and the hallucinations trouble him when in bed; tongue cleaner and moist; bowels regular, stools natural. I directed the medicines to be continued, and half a grain of the acetate of morphia to be given with three of rhubarb, at bed-time.

10th. The patient now takes solid animal food without pain. The morphia at bed-time has procured rest, and the hallucinations have not troubled him. Distention and flatulence are still distressing after meals.

15th. Sudden return of pain after taking food, with creeping, uneasy sensations in the region of the stomach; with the complaint in the stomach have returned all the hallucinations, the mental uneasiness, and despondency. There is no pain on pressure in the epigastrium, and the tongue is moist and clean. He was now directed to take the ammonio-tartrate

of iron, combined with rhubarb, in doses of five grains each, twice a day. The morphia was continued at bed time.

25th. Much improved; little despondency; good nights, with the exception of one, when the morphia was omitted; the countenance is pleasant, and the pulse full and soft. Solid food taken with comfort. The medicines were persevered in for some time, and there has not been any return of disease.

Remarks.—It is probable that the first attack of disease might have been complicated with congestion or slight inflammation, as the patient's occupation obliged him to work with his stomach constantly pressed against the edge of a table, and no remedies afforded relief, except the application of leeches. The second attack, which came on Nov. 25th, although accompanied with some excitement, does not appear to have been dependent upon an inflammatory action. The hallucinations were strictly dependent upon the morbid irritability of the stomach, since we find, in examining the details of the case, that they, with the mental uneasiness, were more or less distressing, as the former was more or less aggravated. A meal of solid food, which taxed heavily the digestive powers, produced the gastrodynia and the hallucinations. In the first instance, they were relieved, during the state of excitement, by leeching the head, but when the disease became evidently apyretic, they were considerably mitigated under the use of the acetate of morphia. The importance of restricting the patient to a pure farinaceous and unstimulating diet, during such affections as the present, is well illustrated by this case. As long as the food is mixed or stimulating, no medicines will afford relief; and if a plan of diet of this kind were established, or an irritating medical treatment employed, the patient would inevitably either become deranged or commit suicide. I saw the case of a poor woman, two years ago, in which treatment of this kind brought about the termination I have mentioned. She had been ill for many months with vomiting after meals, and a sense of broiling in the stomach, accompanied by inde-

scribable sensations of uneasiness in that part, which did not amount to pain, but which produced the utmost degree of despondency. She lived in a remote part of the country, and her medical attendant finding that all the remedies administered rather aggravated than alleviated her state, determined to omit them altogether, and trust to a generous system of diet to restore her. He made interest with some friends, and procured her a barrel of porter, of which he directed her to drink freely, at the same time using animal food as her chief aliment. She followed the plan laid down for one fortnight, and was removed at the end of that period to a receptacle for lunatics. This case rather resembles the one I am about to relate than that I have just mentioned. The latter, I dare say, will strike the reader as in some measure analogous to that of Nicolai the Prussian bookseller, first related by Dr. Ferriar. There are one or two points extremely similar in the two cases. The apparitions or hallucinations which haunted Nicolai visited him first during the period of digestion, and were always most vivid at that time; in my case the hallucinations succeeded invariably to a meal of solid food. Nicolai observed that the phantoms became paler, and at length disappeared during the time he was let blood. The hallucinations, in the present instance, disappeared at once after the application of leeches to the temples; but were again called forth by the irritable condition of the stomach.

There are other forms of disease accompanied by great mental uneasiness, resulting from an affection of the stomach, which is characterized chiefly by derangement of its sensibility; but whether this be seated in the mucous surface itself, or whether this is secondarily affected from congestion, or local determination to the great nervous plexures and ganglia in the vicinity of the stomach, I cannot say. It is accompanied by local and general vascular excitement, and in many instances by great epigastric pulsation. I have met with it as an idiopathic disease, and subsequent to attacks of fever of the typhoid type. I shall illustrate its nature by a few cases.

CASE IX.—*Morbid Sensibility.—Epigastric Pulseation, with great mental Uneasiness.*

A lady, aged 40, had menstruated irregularly since the birth of her last child, which is three years old; occasionally profuse discharges have taken place, but for a month preceding her attack there had been none. Her food now occasioned great pain, accompanied by nausea, and great distention after eating. Sensation of rolling in the stomach, with broiling and intense acidity. These symptoms were partially alleviated by small doses of the ponderous carbonate of magnesia, and the application of a blister. Great despondency succeeded, with indescribable sensations of uneasiness in the stomach, not amounting to pain, but occasioned by a sensation of rolling in it. The nausea continued, and frequently ended in vomiting. The tongue was clean; bowels slightly constipated; pulse sharp, and at 80. On examining the epigastrium; a strong pulsation was evident to the eye; it was confined to this region, and raised the hand with great force when laid over it; it was accompanied by a dull pain, extending over a small surface, which was slightly increased by hard pressure. The skin was also here very hot. Various remedies were tried, but all, even the most simple, such as carbonate of soda and magnesia, with morphia, increased the pain, and added to the distress. Leeches were now had recourse to, which were applied every other day, for six days, and were succeeded by one or two blisters. Under this treatment the more urgent symptoms yielded, but the uneasiness of mind, pyrosis, and occasional vomiting continued, which, when the stomach was able to bear medicine, were relieved materially by small doses of morphia and lime water. During the whole of this distressing affection, which continued for several weeks, the patient had the most haggard and anxious countenance. All kinds of aliment increased the complaint, except Hard's farinaceous food, which was taken with tolerable comfort.

This case, similar in many of its features to inflammation of

the mucous coat of a sub-acute character, does not appear to me to have been a disease of that nature. The extreme despondency, almost approaching to the insane state, the epigastric pulsation, the almost entire absence of tenderness on pressure, and the more than usually irritable state of the stomach, exceeding that observed in sub-acute inflammatory disease, are, in my opinion, proofs that the disease was not of this character, at least had other complications. The "rolling sensation over and over," which this patient complained of, is likewise peculiar. I have seen several instances of it. The poor woman, whose disease ended in mania, mentioned in the note to Case VIII., said she had "a wheel at work in her stomach." The tongue was clean, although the pulse was sharp and frequent during nearly the whole continuance of the disease. The heat in the epigastrium is worthy also of remark. We have in this a class of symptoms certainly indicating increased local determination of blood, but whether accompanied by inflammatory action of the mucous coat or not, is a matter difficult to determine; I certainly am inclined to think that they are not. Dr. Abercromby mentions the case of a lady who had constant vomiting of food, and severe pain, which at length became so bad that she was unable to retain any thing upon her stomach except fluids in very small quantities. No treatment afforded relief, except blisters to the epigastrium. She gradually wasted and died, and on examination, no disease could be discovered in the epigastric region, except some enlarged glands behind the stomach. I do believe that many cases of the description I have related (Case IX.) are rather affections of the cœliac ganglia and great nervous centres,* such as the solar plexus, than diseases of the coats of the stomach itself. The nature of the diseases are such, however, that this can rarely be verified by dissection. Dr. Abercromby's case appears to verify this view; the direct communi-

* *Cerebrum Abdominale.* Lobstein. *De Nervi Sympathaci Fabrica, Usu, et Morbis, Commentatio, &c. &c.*

cation of the coronary plexuses of the stomach with their great nervous centres would at once account for any sympathetic disease of this organ. The distribution of the nervous plexuses also, in the course, and upon the coats of the aorta, and arterial branches in the epigastrium, seem to explain their increased pulsations by some irritation of the nerves supplying them. We know that in common gastritis epigastric pulsation is not present. The ganglion and plexuses of the nerves of the involuntary functions are abundantly supplied with arteries, and consequently must be subject to the same class of diseases, as all other parts into which arterial blood penetrates, particularly inflammation of its terminations; and all the cases of pulsation in the epigastrium, detailed in this paper, were evidently owing to local determination, and relieved by antiphlogistic remedies.

CASE X.—*Morbid Sensibility of the Stomach, with Epigastric Pulsation.*

A lady labouring under hepatic disease, became affected, during its progress, with pain after taking food, occasional vomiting, and tenderness in the epigastrium of a slight character. There was strong pulsation at all times visible to the eye, and communicating a powerful impulse to the hand laid upon it. Her dyspeptic symptoms and the pulsation disappeared after one or two applications of leeches, succeeded by blisters.

CASE XI.—*Morbid Sensibility, with great mental Distress, succeeding Fever.*

A lady, after an attack of typhus fever, became affected during her period of convalescence with constant pain after taking food, and occasional vomiting; the stomach at length became so irritable that it would not retain either food or medicine. The mental uneasiness accompanying this state was distressing in the extreme. She rolled from one side of the bed to the other, constantly complaining of her stomach, and this state continued night and day for weeks. The tongue

was clean, the pulse quiet, the skin cool, and there was no pain whatever in the epigastrum when it was examined by pressure. Opiates, alkalies, and tonics, all aggravated her state of distress and increased the uneasiness. I once ventured to administer a few grains of the carbonate of iron, but its effects were frightful, and the accession of burning pain after it intolerable. Medicines were at length omitted altogether, the patient was removed into the country, the mildest food given in very small quantity, from time to time. Under this plan, after a long period, she at length recovered.

CASE XII.—Morbid Sensibility, with great Despondency, succeeding Fever.

A lady, after an attack of typhus fever, which had prostrated her whole family, and from which she had lost a favourite child, became affected with pain after taking food, accompanied by a burning sensation, and its occasional rejection by vomiting. There was extreme mental uneasiness, and great despondency. The tongue was clean and moist, the pulse soft and quiet, and there was no epigastric tenderness. Medicines and food of all kinds aggravated her condition, and increased her distress. The former were laid aside, small portions of farinaceous food were given from time to time, and blisters applied over the stomach. This disease continued a long time; but the patient, under a continuance of the farinaceous diet and blisters, the only plan which afforded any relief, at length was restored to her accustomed health.

Cases ix. xi. and xii. are examples of that extraordinary state of mental wretchedness dependent upon morbid irritability of the stomach. Case ix. differs from xi. and xii. in being accompanied by considerable local vascular excitement; whilst in the two latter it was entirely absent. The first case succeeding to profuse uterine discharges, whilst the latter are set up during convalescence from acute diseases. Broussais, and the pupils of his school, attribute, as is well known, all these affections to chronic or sub-acute forms of gastro-enteric in-

flammation, his opinions on this head are detailed in his 145th Aphorism.* Although the brain becomes secondarily affected from the irritability of the stomach, it appears that there must be some peculiar organization on the part of the former, some unusual degree of irritability, which renders it so liable to be thrown into a state of morbid sympathy with diseases in other organs. That these forms of stomach disease are dependent universally upon inflammatory action I conceive to be a highly dangerous opinion to entertain. I have seen patients leeched again and again, without the least benefit in such states. I do not mean to deny that increased local vascular action is not occasionally present; I believe it is, and was so in Case ix., but not in xi. and xii. Where this is present, with great mental uneasiness, in such states as those described, it will generally be accompanied by epigastric pulsation. The great point in the treatment of these affections is to remove all sources of irritation from the stomach, both in the form of food and medicine. The smallest portions of the former should at first be tried, and gradually increased; a table spoonful of gruel, or of Hard's farinaceous food, made with water and not milk, which is commonly rejected immediately in form of curd, may be given at longer or shorter intervals, as the stomach will bear it. The best medicines, if the stomach will bear any, which it commonly will not, are a few drops of liq. opii sedativus in lime water, or a quarter or a sixth of a grain of the acetate of morphia, with a few grains of carbonate of soda. With these remedies blisters should be successively applied to the epigastrium; they should be small, and suffered to heal, and then reapplied. I have seen much mischief occasioned by large and irritating blisters, but particularly by the tartar emetic ointment and plaster. These add to the irritation; and I have seen many instances in which they were productive of decided

* Examen des Doctrines Medicales, tome i.

harm. On the other hand, blisters of small size, frequently repeated, are the best remedies I know of in diminishing the irritability of the stomach, and the moment this viscus begins to regain its tone, the patient's mind becomes more settled and composed. In these instances, as in that before mentioned, the extremely irritable mind, and morbid state of feeling of the patient, should never be lost sight of, dependent as they are upon the stomach disease, and aggravated by every cause which increases it. Too much caution cannot be employed; the diet cannot be too unstimulating, or the plan of medication too unirritating and simple. Cases VIII. IX. XI. and XII. are, as I have before said, examples of mental affections, dependent, no doubt, upon some cerebral irritation, (since in Case VIII. there was considerable heat in the forehead, with throbbing of the temporal arteries,) which were called into action by derangement of the sensibility of the nerves of the stomach and its vicinity. Broussais, in the commentary to his 107th proposition,* tells us that the sensibilities of the viscera are infinitely variable, impressions which are not sensible to one person becoming to another stimuli, which are the source of various morbid actions; but that these impressions should so act, he admits a peculiar idiosyncracy, to which he gives the name of "*neuropathie*," and which consists in a natural and excessive irritability of the nervous system. The opinion appears founded in truth and nature, it is the true nervous temperament at its full development. What in another person would produce bodily pain, here is productive of mental disturbance. Insanity is a common termination of prolonged irritation in the abdominal viscera of such patients, particularly in the stomach. I know two instances in my own practice besides the one I have mentioned.

I shall in the remaining part of this paper draw the atten-

* *Commentaires des Propositions de Pathologie*, tome i. page 117. Paris, 1829.

tion to some complications of gastritis, in its sub-acute and acute forms; the first accompanied by remarkable epigastric pulsation, the others complicated with sympathetic diseases of the respiratory organs of great importance.

CASE XIII.—A young man, twenty years of age, was affected with feverish symptoms, after exposure on a damp evening, in some public gardens, which were relieved by aperient medicine. Continuing indisposed, I was requested to see him.

Present state, October 29th, three weeks after the exposure. The first symptom attracting attention, is the extraordinary pulsation of the abdominal aorta; the beating is particularly marked and strong in the epigastrium, evident to the eye, and raising the hand placed over it with very great force. The increased action of the vessel is likewise evident in the lower parts of its abdominal course, when the hand is placed upon it, although the patient is rather robust than at all emaciated. The epigastric region is tense and painful; pain aggravated by pressure; examined by mediate percussion, sounding like a drum; the tympanitic state confined to the epigastric region; pulse at 120, small and bounding; bowels confined, tongue clean, the evacuations, when elicited, are dark and offensive; the breathing is hurried, and accompanied by considerable frothy expectoration. The chest, carefully examined, affords no farther evidence of disease than a slight "rare sibilant," under the left clavicle. This case at first presented some anomalies, which I was at a loss to explain, and I was uncertain whether my diagnosis of the disease was a correct one. I concluded, although many of the usual symptoms of gastritis were absent, that the patient was labouring under sub-acute inflammation of the mucous coat of the stomach, which had produced a tympanitic state of this organ, either from gaseous effusion, or from loss of tone, which from its distended state, pressing upon the aorta, produced its laboured and increased pulsations. Such was my first view of the case, its

further detail will shew whether it was a correct one. I should observe that the tympanitic state of the stomach was so marked, that the form of the organ might be traced by percussion, the resonance not extending beyond it.

November 13th.—A variety of treatment had been employed from the date of last report, but none appeared to have afforded any relief till the employment of leeches and blisters; these have during the last ten days been frequently repeated, and with great success. The distention, and tympanitic state of the belly are much reduced, the tenderness on pressure less, the stools of better character. The pulsations becoming less marked in direct ratio with the subsidence of these symptoms. The patient was ordered occasional doses of blue pill, rhubarb, and senna, with a combination of mild tonics and aperients.

16th. Till to-day there has been gradual improvement, less cough, the tenderness of the epigastrium had disappeared, the tympanitic state of the stomach was gone, the stools had become natural, and there was no epigastric pulsation. To-day there is considerable tenderness, the stools are dark, the tympanitic state has returned, and the pulsations are as violent as before.

18th. A repetition of leeches and a blister have again removed the pain, the distention, and the pulsations, but now the patient is permitted to take food of a more nutritious character; great distention and uneasiness follow each meal. He was directed to take five grains of rhubarb, with one of senna, half an hour before each period of taking food.

28th. All the morbid symptoms have disappeared. There have been at intervals slight returns of pain, for which the patient has applied, without advice, three or four leeches; the returns of pain were accompanied by distention, beating, and black stools.

There were anomalies in this case certainly, and it differs very much from one of pure gastritis, but when we take into

review the concatenation of symptoms, epigastric pain, aggravated by pressure, distention, and dark stools, with the state of the pulse, and no indication of disease in any other organ, we shall be led to the conclusion that the symptoms were dependant upon sub-acute inflammation of the mucous coat of the stomach. There is no calculation to be made *a priori* what will be the result to other organs from irritation set up in one. The relation of organs to each other are so different ; their susceptibilities so various ; their liability to morbid impressions so changeable, that we can rarely predict what will be, we can but act upon what is. Thus in the present instance there is great epigastric pulsation, attendant upon what appears to be an inflammatory state of the mucous membrane of the stomach, whilst the disease might occur a hundred times without the same complication. The cough, the pulsations, the frequency of pulse, and the distention, give way to antiphlogistic treatment, recur when it is discontinued, and again are removed, and ultimately disappear altogether, under a duly regulated perseverance in the plan. The success of the treatment, rather than the symptoms of the disease, in my opinion, stamps its nature. One of the most common symptoms attendant upon gastritis is here absent, sickness, and pain after food, and I have frequently examined bodies where the most vivid injection of the mucous surface has been present, and no sickness to indicate it ; such examinations must be familiar to practical men. I conceive it highly probable that in this, as well as in the two other cases of epigastric pulsation I have mentioned, that in addition to whatever might be the state of the mucous coat of the stomach, there existed a congested or inflammatory state of the ganglia, and great nervous plexuses in its vicinity.

Gastritis, occurring in a highly susceptible state of other organs, sometimes produces in them forms of disease, which are actually of more consequence than the inflammation of the stomach which called them forth. I have given one or two instances of such sympathetic diseases, as they affect the brain

in some diseases of the stomach, characterized chiefly by derangements of its sensibility. I shall now draw the attention to other forms of disease, dependent upon pure gastritis, where the sympathetic or secondary disease, by the violence of its symptoms, has in some degree hidden the primitive morbid state upon which it depends.

CASE XIV.—June 8th, 1834.—*Symptoms of Gastritis, complicated with those of acute Catarrh.*

J. E., thirty-two years of age. Ill for two years with pain in the epigastrium, sickness and occasional vomiting.

Present state.—Constant pain in the stomach, aggravated to a great degree by taking food, which is commonly rejected by vomiting; great tenderness in the epigastrium, the slightest pressure occasions most violent pain, which is confined to a small surface; the epigastrium is hard and tense, and feels as though some resisting body lay under the muscles. There is no uneasiness whatever in any other part of the abdomen.—The tongue is coated with a yellowish brown fur, red at its point and edges, and the papillæ enlarged and florid. The countenance anxious and pale, extremities cold, pulse small and frequent, great difficulty of breathing, with constant cough, and bloody expectoration; the stools occasionally streaked with blood.

The patient was confined to strict farinaceous diet; bottles of hot water were applied to the feet, and twelve leeches to the epigastrium. The leeches were repeated on the 9th, 10th, 11th, and 12th to the same part, in lesser numbers, in proportion to the degree of complaint; and on the 12th they were succeeded by a blister. On the 20th, the food, which then consisted of thin animal broth, occasioned no pain; no tenderness in the epigastrium on pressure; the difficulty of breathing had subsided, and there was neither cough nor expectoration. The patient, during the whole course of the disease, took no other medicine than a few grains of the ponder-

ous carbonate of magnesia with morphia, when the acidity accompanying the vomiting was very intense.

This case, evidently one of pure sub-acute inflammation of the mucous coat of the stomach, confined to a small extent of surface, is remarkable for the violence manifested in the sympathies of the organs of respiration. The difficult and hurried character of the breathing, with the continued cough and bloody expectoration, were as intense as though these parts had been the primary seats of disease, though they were merely affected by sympathy, or rather secondarily, in consequence of the disease in the stomach, which is evident from their morbid symptoms becoming mitigated, and disappearing under remedies applied to the stomach alone. In this example the disease of the mucous membrane of the air passages, was the seat of the secondary or sympathetic disease, which appears not to have been limited to nervous irritation of these parts, but to have actually proceeded to a degree of bronchitis, marked by the character of the breathing, the cough, and bloody expectoration. The three first cases given by Broussais in the article "Gastrite" in the second volume of his "*Histoire des Phlegmias Chroniques*," are examples of the same forms of bronchial disease, dependent upon gastric inflammation. In the extension of all diseases by sympathy, the first morbid impression made upon organs, previously healthy, from another which is diseased, is through the medium of the nerves supplying them, but if their irritation be long continued, a degree of vascular excitement is produced, and inflammation is the consequence. The expression made use of by Andral, as quoted by Dr. Stokes,* explains this at once, "that a lesion of innervation may be followed by that of circulation." Examples of the first are common; I give one to illustrate this point.

"A lady had constant and violent cough, which had continued for several months, she emaciated considerably during its progress, and had night perspirations. It was accompanied by

no expectoration, and on examining the chest by auscultation the lungs were found perfectly healthy. There was, however, considerable fulness of the hepatic region, which was very painful on pressure, the pressure at once producing pain and bringing on the cough. By the application of leeches to the region of the liver, two or three times, the tenderness left her, and the cough disappeared at the same time. She took no medicines to allay it."

The respiratory organs commonly suffer, and sometimes to a great extent, as the consequence of gastric, or gastro-enteric inflammation. In case xiv. the stomach affection preceded the difficulty of breathing, which was evidently produced by, and strictly dependent upon, the former. In such cases as the one now under consideration, when the disease is suffered to proceed to great extent before medical relief is resorted to, nothing but the most accurate history of the disease, and the stethoscope, can possibly guide us to a correct knowledge of the pathologic state of the patient. Although, in the first instance, the cough is purely sympathetic, and the disorder of the respiratory organs merely functional, we shall, as in the preceding instance, in long-continued affections of this kind, have congestion of the mucous membrane, succeeded by inflammation, with frothy mucous expectoration and bleed.

The subject of morbid sympathy is one, concerning which we are on the very threshold of inquiry. The liabilities of certain organs to put on diseased states, consequent upon similar diseases in other organs, under certain states of susceptibility of which we know nothing, are facts of the highest importance in practical medicine. Those which I am about to enumerate have hardly as yet been observed, and I do not know that I should as yet have ventured to record them, but for a remark of Dr. Stokes', that "actual disease of the lung may result from long-continued or severe gastric inflammation, or where there is a predisposition to preliminary disease." * This

observation appears to have resulted from a perusal of those cases of Broussais before alluded to ; with the exception of these, I am not aware of any other facts which bear upon this point.

CASE XV.—*Symptoms of Gastritis with Pneumonia.*

J. G., an athletic man, by trade a butcher, states that he had been ill a fortnight at the time of his first application for medical assistance. He then complained of acute pain in the epigastrium, with a sense of constriction ; the pain was aggravated to a great degree by slight pressure ; food and drink of all kinds added to his distress, and were constantly rejected by vomiting ; there was no pain or uneasiness in any other part of the abdomen. The countenance was anxious ; the tongue red at its point and edges, and the pulse small, frequent, and fluttering. There was considerable difficulty of breathing on slight exertion. On carefully examining the chest by auscultation, there was a strong "rake crepitant," occupying the whole of the superior lobe of the left lung, most distinctly marked both in the infra-clavicular, the axillary, and scapular regions. I disregarded the pain in the epigastrium, and the constant sickness, and ordered the patient to be freely bled in the arm. The blood presented the usual characteristics, the clot was firmly contracted, and covered with a layer of lymph half an inch thick. On the succeeding day, the patient's state was not at all amended ; the "rake" continued as intense, and the symptoms of gastric derangement were, if possible, more urgent.—Leeches were now applied to the epigastrium, and the patient took the smallest quantities of cold gruel. On the following day the patient was much relieved, the difficulty of breathing and "rake crepitant" were much less, and had abated in direct proportion to the mitigation of the stomach disease. The local depletion was continued for a few days, and the patient continued the plan of abstinence, except from thin, cold gruel. On the tenth day from his application, there was no sickness or epigastric tenderness, he could take light food without pain or

distention ; no difficulty of breathing, and no trace of any morbid "rale" in the lung. I believe I am correct in stating that this patient took no medicine during the progress of his disease.

Whether the gastritis, for his symptoms were evidently those of this disease, or the pneumonia, were here the primary affection, I cannot pretend to say, and it is of little moment, it is plain there was inflammation of two organs in an acute form. It is to be remarked, that the bleeding on the first day of this patient's application did not apparently benefit the pneumonic inflammation, and certainly did not at all relieve the symptoms of gastritis ; the first application of leeches to the epigastrium materially benefited both, and this was the sole remedy that was afterwards employed. I should be inclined to believe, from the effects of the remedies, that the pneumonia was subsequent to, and dependent upon the gastritis ; though if the disease had been permitted to go on unchecked, it would not have been relieved, as it evidently was, by leeching the epigastrium alone. However this may be, this case shews that in certain states there exist sympathies between the lungs and the stomach, which render disease in one an origination of disease in the other. I think, on careful examination of the results of the treatment, there can be little doubt of the pneumonia having succeeded to the gastritis, which became its exciting cause. I would not come to this conclusion from this case alone, but the similarity of the succeeding one renders this almost a matter of certainty. The co-existence merely of the two states contra-indicates the use of antimonials, but particularly Laennec's sheet-anchor of the tartar-emetic.

CASE XVI.—*Pneumonia with Symptoms of Gastritis.*

J. H., an athletic labourer, about forty years of age, applied to me, December 29th, stating himself to have been ill for two days, with pain in the stomach and vomiting of food.

At the time of his application he had constant sickness, the stomach rejected every thing that was taken ; acute pain in the

epigastrium, increased to agony by pressure ; the breathing was hurried, accompanied by constant cough and expectoration of frothy, brown-coloured mucus ; pulse small, frequent, and unsteady. On examining the chest, by percussion and auscultation, it was observed that there existed a slight dulness over the middle lobe of the right lung. The respiration here was only distinct in places, and where it was evident, accompanied by a strong "rôle crepitant." In the whole of the superior lobe of the right the "rôle" was strongly marked.

On the 30th his state was worse. The tenderness in the epigastrium was very great, although the sickness had in some measure abated ; the left side of the chest was duller on percussion than yesterday. The "rôle crepitant" was strongly marked in places, but in many points the respiration was absent. Leeches were applied over the chest yesterday, and to-day the patient was bled from the arm.

31st. The respiration more distinct in the upper and lower portion of the lung, the rôle accompanying it in these points approaching more the character of the "rôle muqueux." In the centre of the lung there is still absence of respiration in points, with a "rôle crepitant," where the respiration is perceptible. Still excessive tenderness in the epigastrium, with occasional vomiting. Twelve leeches were ordered to the epigastric region.

January 1st. The cough and difficulty of breathing much relieved. Pulse steadier and fuller at 70. The patient states that the relief afforded by the last leeches was greater than from all the previous treatment.

On the 4th the epigastric tenderness and vomiting had disappeared, there was no hurried breathing, the pulse was steady and soft. There was little cough, the respiration was distinct in the superior lobe of the lung, absent in places in the middle and inferior, accompanied, where present, with a strong "rôle muqueux." In certain points the breathing was distinct and natural without this complication.

This case affords another example of the complication of gastritis and puermonia similar to the last, although the diseases in this instance appear in both to have been of a more acute character. We find the symptoms of puermonia and gastritis both strongly marked in this patient's case on the first application for relief on December, 29th. On that day and on the 30th, local depletion from the surface of the thorax and general bleeding were resorted to, certainly with some effect upon the inflammation of the lung, but without much influence upon the cough and hurried breathing. On the 31st the epigastrium was covered with leeches, and at this period, although the disease was mitigated, which is evident from the physical signs afforded by the stethoscope, the sense of oppression and constriction which the patient experienced, with the hurried breathing and cough, did not abate till the application of leeches to the stomach. The patient stated that to himself he appeared no better till the application of leeches to this part, after which he expressed himself greatly benefited. I do not pretend to offer any opinion upon the primary seat of disease in this case, whether one organ became diseased consecutively to and in consequence of morbid action in the other, or whether the affections were merely coincident. This is difficult to decide, but the effects of the treatment prove that the most marked benefit resulted to the disease in the lung from the remedies applied to the stomach, whilst the reverse does not appear to have been the case.

The sympathies between the stomach and the lungs are easily explained by the communications existing between the pneumo-gastric and splanchnic nerves, and the semi-lunar ganglia and plexuses of the epigastrium. The symptoms which I consider those of gastritis in the two preceding cases, are common likewise to inflammation of the semi-lunar ganglia and its plexuses, at least such were the symptoms which Lobstein*

found to attend affections of these parts, as verified by his observations and dissections. No one can determine, from the symptoms merely, whether the affection of the stomach was sympathetic with affection of the nervous centres of the epigastrium, or whether the mucous coat was alone affected, or both. In some instances Lobstein* found both inflamed.— It is singular also that this author should have found the nerves of the lungs, i. e. the pneumo-gastric, and the branches from the thoracic ganglia, affected in that species of peripneumony in which the lungs offer a red induration or resemble the structure of the spleen. The nerves were here red and tumid, or softened, breaking from the slightest tension. (*Hepatisation rouge*, Laennec.) Where these organs were affected with ulceration, vomica, or tubercles in the incipient or miliary state,† the nerves were apparently free from disease.

Recapitulation.—It will be at once seen, from a perusal of the sixteen cases I have detailed, that although they were analogous in one great point, that of disease of the stomach, they were in most others very variable. We find the simplest forms of disease commencing in mere uneasiness, hardly amounting to pain after taking food, and thence progressing into violent *gastrodynia*, to sympathetic affections of the organs of respiration, in three instances terminating in acute inflammatory diseases. In seven cases, the organs of respiration were the seat of either nervous or vascular lesions, consequent upon the stomach disease. In four cases, mental disturbance was present, in one instance producing hallucinations, and disposition to suicide, and a degree of despondency almost approaching the insane state in the other three.

1. *Complication with Gastritis.*—In two cases (iii. and iv.) the disease, (i. e. the morbid sensibility, or irritability of the

* Lobstein, p. 152.

† P. 153, 154.

stomach or *gastrodynia*,) was evidently complicated with inflammation, and in two others (v. and vi.) it succeeded to a lesion of this character. The latter circumstance at once stamps it as an affection of a distinct character from inflammation, although it is frequently complicated with, and inflammation is frequently produced by it. Where morbid sensibility has been present many months, it sometimes becomes complicated by sub-acute or chronic gastritis, and in these instances much more circumspection is requisite in ascertaining clearly the history of the disease, and in applying the remedial agents, than in any other form of stomach complaint. Here a combination of treatment is required ; an antiphlogistic, and a sedative one, and while a moderate local depletion is absolutely necessary on the one hand, the internal remedies should be of the character made use of in the details of the preceding cases. Whilst we are leeching the epigastrium, the internal treatment cannot be too mild, or unirritating, but must be varied of course, to suit the particular circumstances of the patient.

2. *Lesions of the Respiration.*—In seven out of the sixteen cases related, lesions of this character were observed ; in the more simple forms, we had present merely spasmodic cough, and hurried breathing ; in others, frothy expectoration ; in one, bloody expectoration ; in two, pneumonia. In most, no physical sign of disease of the respiratory organs was present, in two, slight rales accompanied the cough, and in two others the physical signs of pneumonia were unequivocally present. In all, the lesions of the respiratory organs disappeared, as the disease of the stomach was mitigated or cured.

3. *Lesions of the intellectual Faculties, and of the Senses.*—These lesions were observed in four of the cases I have detailed, and chiefly consisted in impaired judgment, and excessive despondency ; in one, the disposition to suicide was almost irresistible ; this case was also remarkable for hallucinations of the sense of vision. I have, in the remarks on this and other cases, alluded to instances in which the same lesions of the in-

tellectual faculties have terminated in actual and confirmed insanity. All these affections of the mind were in strict relation to the degree of the morbid sensibility of the stomach, and were aggravated, and subsided with it.

4. *Lesions of the Circulation.*—These chiefly relate to the pulsations in the epigastrium, observed in three of the cases. I do not know to what exact pathologic condition to refer these pulsations. They were all accompanied by local determination of blood, and heat in the epigastrium, but the symptoms which accompanied them certainly did not resemble pure gastritis. My own conjecture is, that they are owing to irritation of the great nervous ganglia, and plexuses of the epigastrium, lying behind the pyloric portion of the stomach, and ramifying upon the vessels of the coeliac axis, and arterial system of the abdomen generally ; for in one instance the pulsations might be followed along the course of the aorta to some distance. Whatever might have been the primary nature of these irritations, they were evidently accompanied by increased local vascular action, and were relieved in all the examples by depletion ; in all they ceased on the subsidence of the stomach disease.

ART. IV.—*First Report of the New Lying-in Hospital, Dublin, for the Year 1834.* By THOMAS EDWARD BEATTY, M. D., M. R. I. A., Master of the Hospital, consulting Accoucheur to the City of Dublin Hospital ; Lecturer on Midwifery in the School of Medicine and Surgery, Park-street, and lately Professor of Medical Jurisprudence to the Royal College of Surgeons in Ireland.

THIS hospital was opened for the reception of patients, in April, 1834. It contains twenty-five beds, distributed through five commodious and well ventilated wards ; besides accommodation for three intern pupils ; apartments for the resident as-

sistant, nurses, housekeeper, &c. ; and a large and convenient lecture-room and museum. The situation in which it is placed, is well calculated to forward the object of its establishment, being about the centre of the south-eastern district of Dublin, and in the immediate vicinity of its poorest part.

Besides the accommodation in Hospital, it has been found expedient to undertake the attendance on poor lying-in women, at their own houses ; as experience has shewn that many of that class are unwilling to absent themselves from home during the period of their confinement, in consequence of having families depending upon their superintendency. A dispensary for the treatment of diseases of women and children is open daily ; and on two days in the week vaccination is performed. The beds are not confined exclusively to labour, but any interesting or urgent cases of the class of female diseases, are admitted, with a view of both giving relief to the sufferer, and affording pupils an opportunity of becoming acquainted with a class of diseases, which it is well known the generality of students have no means of studying.

The locality of the hospital is most favourable for the attendance of pupils, being in the immediate vicinity of Sir P. Dun's hospital, the School of Medicine, Park-street, and the Medical lecture-rooms of the University Professors, and within a convenient distance from the City of Dublin, Meath, and Mercer's Hospitals, and the College of Surgeons. Since the institution was opened, the total number of cases amounted to 410 ; of whom 310 were admitted into hospital, 299 were delivered, the remaining 11 being cases of female disease ; 100 were attended in labour at their own houses ; upwards of 3500 women and children have been prescribed for at the dispensary, and 220 children were vaccinated.

An accurate registry of the cases is kept, from which I have been able to draw up the following tables :

WOMEN DELIVERED.

Naturally,	390	
Artificially,	9	By
Total,	399	{
		Turning, 5 Perforator, 2 or 1 in 199½ Forceps, 2 or 1 in 199½ 9

PRESENTATIONS.

Head,	362	
Face,	2 or 1 in 199½	
Breech,	10 or 1 in 39½	
Inf. Extremities,	6 or 1 in 66½	
Sup. Extremities,	3 or 1 in 133	
Placenta,	4 or 1 in 99½	
Funis,	2 or 1 in 199½	
Twin cases,	10 or 1 in 39½	
	399	

DURATION OF LABOUR.

Under 6 hours,	248	
12	107	
24	26	
36	12	
48	4	
50	1	
96	1	
136	1	
Total,	399	

CHILDREN BORN.

Males,	200,	of whom alive,	184,	dead,	16
Females,	209,		199,	.	10
Total,	409	Total,	383	Total,	26

Of the 26 born dead, there were—

Turning cases,	.	.	.	5
Footling,	.	.	.	4
Breech,	.	.	.	2
Perforator,	.	.	.	2
Forceps,	.	.	.	2
Funis,	.	.	.	1
Twins,	.	.	.	4
Premature,	.	.	.	3
Natural,	.	.	.	3
Total,	.	.	.	26

TWIN CASES.

Both presented head in	.	.	4	cases.
Both feet,	.	.	1	
Both breech,	.	.	1	
1st head, 2nd Breech,	.	.	2	
1st head, 2nd Feet,	.	.	2	
Total,	.	.	10	

FATE OF CHILDREN IN TWIN CASES.

Both alive in	.	.	7	cases.
1 alive, 1 dead,	.	.	2	
Both dead,	.	.	1	
Total,	.	.	10	

Total born alive,	16
Total born dead,	4
	—
	20

MOTHERS DIED.

Of puerperal fever,	3
Abscess of ovarium, bursting into peritoneum,	2
Inflammation of uterus,	1
Pneumonia,	1
	—
Total,	7

Several cases of abortion occurred in the extern practice at different periods of utero-gestation, but in all, the progress was happily concluded. In two, the ovum was found on examination lying in the os uteri, part of it within and part without, and keeping up the discharge of blood. In one of these, the case had been going forward for a week before I saw the woman, and the ovum had become putrid in its new situation, which was manifested by an escape of fetid gas from the vagina, on the application of pressure above the pubis. In both these cases the ovum was removed by the fingers, with the immediate effect of arresting the haemorrhage. Some difficulty was experienced in the removal, from the ovum eluding the grasp of the fingers. I would on a similar occasion (if not succeeding in this way) make trial of a pair of common polypus forceps; but this is a proceeding which should not be adopted in private practice, unless absolutely required; for patients, and their friends, (who often think it necessary to give opinions on all matters connected with midwifery,) are very apt to exclaim against the use of instruments in abortion; and if any thing goes wrong with the case subsequently, the whole blame is laid to the charge of the operation.

There was but one case of uterine homorrhage following delivery in the hospital, and likewise but one retained placenta. This immunity from these troublesome and dangerous conse-

quences, I ascribe to the strict attention paid to the uterus at the time of the expulsion of the child. The binder is always passed round the waist before the head is born, and after the shoulders of the child have passed the external parts, firm pressure is made with the left hand upon the uterus, until the feet are expelled, not pulled, from the vagina, and then the binder is tightened. This practice, which I have elsewhere insisted upon in this Journal, secures the patient against uterine hemorrhage, and favours the detachment of the placenta.* As a contrast to this success, we had several instances of retained placenta in the extern practice; the earlier part of the cases having been mismanaged by ignorant midwives, and some severe cases of uterine hemorrhage were met with, to be traced to the same cause. In the two face presentations, the labours terminated favourably for both mother and child; the duration of labour in both was under twelve hours, although the second case was a first birth.

Of the ten breech presentations, two of the children were still born, both of them being first cases. In one of these, the face of the child was directed to the belly of the mother, and it was found necessary to pass a finger into the groin of the infant, to assist the delivery; after considerable delay and difficulty the breech was expelled, the face of the child was turned into the sacrum, and finding the pulsation in the cord ceased, I finished the delivery as speedily as possible, but we were not able to resuscitate the child.

* I lately attended a lady for the first time, in labour of her third child, who, I was informed, had after the two former deliveries profuse hemorrhage, in consequence of relaxation of the uterus, by which her life was brought into great danger. I took the precaution of having half a drachm of the ergot of rye infused in 3 oz. of boiling water, and as soon as the head of the child was born, I gave her the dose, powder and infusion together. The consequence was, that with the assistance of pressure on the belly, and the application of my buckle and strap binder, the labour was speedily concluded, and the placenta thrown off, without any unfavourable circumstance; and the uterus never relaxed afterwards.

The mortality attending the footling cases was much greater, they were six in number, and four of the children were still born, thus supporting the opinion that breech presentations are more favourable to the child, than presentations of the feet. The reason of this difference is sufficiently obvious; in the former the greater portion of the labour is gone through, with the legs doubled up on the belly of the child, thus preventing pressure upon the cord, and offering a large body to dilate the external parts, while in the latter, in consequence of the easy passage of the feet and legs, the body of the child is brought down into the pelvis, before the parts are dilated sufficiently to permit it to pass, and the unprotected umbilical cord is exposed to all the pressure during its delay in the passage.

The cases in which the shoulder or arm presented, were three in number, in all of which the operation of turning was performed. In two the mothers made a good recovery, and in the third she died on the fifth day after delivery, of inflammation of the uterus extending to the peritoneum. The first case occurred in an extern patient, residing in the neighbourhood of the hospital. It was her first pregnancy. On application being made at the hospital, I went with the pupil on duty to examine the case, and found that she had been in labour about five hours. On passing my finger into the vagina I detected the left arm of the child lying across the os uteri. The membranes unbroken, and the os uteri dilated to about the size of a crown piece. The apartment in which she lay being confined and inconvenient, I had her removed in a jaunting car to the hospital, and in about an hour after, the pains being pretty strong, and the os uteri having dilated so as to allow the passage of the hand, I proceeded to turn the child, which I accomplished in about half an hour. The child was born dead, but the mother recovered without any unpleasant symptom. The second case presented nothing remarkable, the child was turned and delivered dead; the mother recovered. The third case had been in labour twelve hours before I saw her. She

was an *extern* patient, and the pupil on duty finding that at the end of that time, although the *os uteri* was completely dilated, he could not distinguish any presentation, sent for me. I saw her at twelve o'clock, P. M. and on examination, found the bag of waters unbroken, protruding into the vagina, the *os uteri* dilated to its fullest extent, and notwithstanding very severe and frequent pains; no part of the child was within reach of the finger, passed in the ordinary way. I then ruptured the membranes, and soon ascertained that a shoulder and upper part of an arm, which turned out to be the right, occupied the brim of the pelvis. I immediately bared my arm, and passed my hand into the vagina, and through the *os uteri*; and here I encountered a difficulty. The opening I had made in the membranes was too small to admit my hand, and instead of passing into their cavity, it passed on the outside, between them and the uterus, a mistake which was not discovered until I began to search for the feet of the child, which I found it impossible to grasp, owing to the interposition of the membranes. These I endeavoured to lacerate with my fingers, but in vain, for being no longer distended by the waters, they yielded before the pressure in every direction, until they came in contact with the foetus, in which situation pressure upon them was of no avail. Finding it useless to continue my efforts under such circumstances, I was reluctantly obliged to withdraw my hand, (an unpleasant resource under any circumstances, but doubly so when the uterus is acting strongly,) and begin the operation afresh, taking care to search for the opening in the membranes. After some patient exertion, I was able to regain the ground from which I had retreated, and I soon succeeded in reaching the feet. A good deal of difficulty was now experienced in causing the foetus to revolve in the uterus, but by gentle and continued efforts, I at last succeeded in getting down the feet, having occupied fully three quarters of an hour in the operation. The rest of the delivery was accomplished with sufficient ease, and a still born child was extracted. The

following day, the mother was found to be going on favourably; she had slept well, her pulse moderate, and no pain was complained of. The next day furnished the same report, her bowels had been well freed by castor oil. The third day I found her complaining of pain in the region of the uterus, greatly increased by pressure, her pulse 110, skin hot, lochia suppressed. I bled her to $\frac{5}{6}$ xvi., gave her a bolus of calomel and jalap, and ordered stupes to the belly. Next day, the fourth after delivery, all the symptoms aggravated, pulse 120, entire abdomen painful and swollen, countenance sunken, stomach rejecting drinks. Ordered pills of calomel and opium every two hours; leeches, and turpentine stupes to the abdomen. Fifth day, belly tympanitic, passing stools involuntarily; vomiting; incoherent; pulse 140, weak. Continue medicines with increased quantity of opium, one-half grain instead of one-fourth in each pill, to have port wine and water in small quantities to drink. She died the next morning. I was very anxious to have a post mortem examination, but could not obtain permission. From the course of the symptoms, however, I think there can be little doubt that this was a case of inflammation of the substance of the uterus rapidly spreading to the peritoneum.

The proportion of placenta presentations is large, but the nature of the institution is calculated to bring such under observation; for in these cases it is often impossible to remove the patient to hospital, and unless an extern practice be followed they must of course pass into other hands. By combining the extern with the intern practice, I thus secure cases of the greatest interest. All the four placenta presentations occurred in extern patients. In the first, application was made at the hospital in consequence of severe haemorrhage, the second time of its occurrence within the month. On examination, I found the os uteri dilated to about the size of a half crown piece, thick and rigid, and the greater portion of it covered by the placenta. I plugged the vagina, and wished to have the patient re-

removed to hospital, but she was unwilling to go, so I left her in charge of a careful pupil, with directions that I should be sent for in case of the occurrence of pains or haemorrhage. The latter, accompanied by labour pains, recommenced with violence at six A. M. the following morning, at which time I was engaged in attendance a few miles from town. My friend, Dr. Montgomery, kindly hastened to her assistance, on being informed of my absence, and finding the os uteri sufficiently dilated, delivered her by turning the child, which was born dead.

In the second case, labour came on about the eighth month with considerable haemorrhage, in consequence of which I was sent for by the pupil on duty. I found the os uteri nearly dilated, and a small portion of the placenta projecting into its area at the back part. The head presented, and finding that the pains (which were very strong) caused a manifest advance at each recurrence, I determined to leave the case to nature. In a short time the head descended into the pelvis, leaving the edge of the placenta above it, from which time the loss of blood ceased. The child was expelled in about two hours from my arrival, still born. The placenta and some large coagula followed, and the mother recovered well.

The third case was that of one of the nurses of St. Mark's hospital, in whom a draining of blood had been going on for some time before she applied for assistance. I found her with the placenta occupying nearly two-thirds of the os uteri, then dilated to about half its extent, but unyielding. The haemorrhage constant, but not profuse. I plugged the vagina and set a careful watch over her. I visited her in six hours afterwards, and found her complaining of retention of urine, which was relieved by passing the catheter. I found the advantage in this, as in other cases, of having the plug composed of separate pieces, generally three, by which the outer piece can be withdrawn for the purpose of passing the catheter while the inner remains undisturbed. In six hours more, at twelve P. M., I found that in going to stool the entire plug had been expelled,

and the draining of blood was going on. The os uteri was now relaxed so as to give permission to the hand to pass, and although the haemorrhage was at no time violent, yet being constant, I was unwilling to leave the patient undelivered; I accordingly turned the child, and left her well. The child was dead, but the mother recovered.

The fourth case occurred in the eighth month. The haemorrhage was violent, and the os uteri soon dilated sufficiently to enable the hand to enter and turn the child, which was still born. The mother did well.

Of the two funis presentations, one of them terminated in the birth of a living child. The mother had borne four children previously, the pelvis was roomy, and the labour short.

The twin cases amounted to ten, of which four had both heads presenting. Two had the first, head; second, breech;* two had the first, head; second, feet; and two had both breech. Of the twenty children born in these cases, four were dead; two of them in one case; the others, the second of separate births. The two that were still born together, occurred in a case in which the mother was seized with violent convulsions early in the course of the labour.

The deaths that occurred were seven. Of these three were from puerperal fever, which made its appearance in our wards in the last week of October. At that period the hospital was very full, owing to the circumstance of the fever having been for some time prevalent in the Britain-street hospital. This, coupled with a manifest disposition to the disease which had existed through the whole summer and autumn, contributed to its development at that time. The first patient who fell a victim was attacked on the ninth day after delivery, when she

* In one of these, the first, a male, weighed 8½ lb.; the second, female, weighed 7 lb. 10 oz.; total 16 lb. 2 oz.: both alive. The labour lasted an hour and half. The heaviest single child born in the hospital weighed 11 lb.

was walking about the ward, and preparing to leave the hospital. An attack at so late a period is rather a rare circumstance. The disease was most malignant in this and the other cases that occurred at that time. It commenced with rigor, followed by pain in the belly, of very severe kind ; the countenance quickly became of a muddy yellowish cast ; the pulse rapid and feeble ; the belly tympanitic ; wandering of mind during the last twelve hours ; cold clammy sweat ; and death on the third day. The second patient was attacked on the same day, being the third after delivery, and died within a few hours of the former. In the third case, the progress of the disease was slower ; death did not take place until the fifth day. These were the only fatal cases of the disease, but several patients were affected at the same time with fast pulse, dry hot skin, tender belly, great thirst, suppression of lochia, and restlessness, shewing the great disposition to the disease which then prevailed.

The treatment pursued in the cases which terminated unfavourably, consisted of leeches to the belly and constant stupor, with the occasional application of flannel wet with turpentine ; calomel and opium given in frequent doses ; and the freeunction of mercurial ointment. When the belly became tympanitic, the turpentine alone, and in combination with castor oil, was given internally. The same treatment was adopted in six of the cases which recovered ;* and I found that when the system became affected by the mercury the symptoms began to subside. Finding that nine cases had occurred in a short space of time, I came to the resolution of not admitting any other patient into hospital, and I cleared the wards with as much expedition as was consistent with the safety of the patients. I kept the hospital closed for a fortnight, during which time it was thoroughly cleansed and ventilated, and all patients who applied were attended at their own homes. The disease

* One of these was a woman who had been more than a month in the hospital, having been retained in consequence of a cutaneous eruption.

has not appeared since. The co-existence of puerperal fever with erysipelas was very remarkable at this time, and during the whole summer. It is well known that the latter disease committed terrible ravages in hospital, and private practice, during the greater part of the year; and whether the diseases are identical or not, the experience then afforded gives strong ground to suppose that the same influence is favourable to the production of both. A case which occurred in my private practice, in the early part of summer, goes far to establish, in my mind, a close connexion at least between the two diseases. It was the only case of true puerperal fever I saw in private, and occurred in a lady residing a few miles from Dublin. She was attacked about thirty-six hours after delivery, and was dead in forty-eight hours after. The child to which she had given birth was seized with erysipelas in four days afterwards, beginning on the right hand and arm, and then appearing on the face, body, and left leg, rapidly becoming gangrenous, of which disease it died in five days. The nature of this communication is such as to prevent my entering more at length on this subject at present, but I expect to do so on some future occasion.

Two out of the seven cases of death occurred from abscess in the ovary, bursting into the peritoneum. The first was in a woman, aged thirty-eight years, after delivery of her first child. She came into hospital on the 30th of December, with false pains, and did not fall in labour until the 4th of January.* From her age, and peculiar make, to which I will refer when I come to mention the instrumental cases, I anticipated a difficult labour, in which I was not deceived, as it lasted three days. She was delivered, however, without assistance, which

* This woman stated, that the only occasion on which she had seen her husband, and could have become pregnant, during the year, was on the 19th of March, 1834, making a period of 291 days, or forty-one weeks and four days of utero-gestation.

I withheld in consequence of a perceptible, though slow, progress of the head through the pelvis. Next day, pulse 120; bad cough, which she had before admission; belly not tender; bowels freed. Following day pulse as before; intense bronchitis of both lungs, inflammation of vagina, and foetid discharge. Calomel, ipecac. and opium, every two hours; blister to the back, and stupes to the belly, and syringing with warm water to be used frequently to the vagina. Day after, chest somewhat relieved, stethoscope gives less indication of bronchitis; belly tender, particularly in the right iliac region; pulse 120. Pills of calomel, Dover's powder and James' powder, and friction with mercurial ointment. Following day, being the 4th after delivery, the pain in the belly became greatly and suddenly increased; the breathing hurried; countenance livid and sunken; pulse 140; extremities cold; vomits her drink. She died that night. On examining the body the lungs were found full of the frothy fluid of the last stages of bronchitis. In the belly, patches of lymph were discovered on the peritoneum, a large quantity of pus in the pelvis. The uterus and left ovary enlarged and highly inflamed, and a large gangrenous abscess in the right ovary, which had burst, and given issue to the matter found in the pelvis. The vagina and rectum were both extensively inflamed.

The other case occurred in a woman, aged 30 years, who was delivered of her first child on the 15th February, after an easy labour of eight hours. She complained of pain in the uterine region extending to the right side, on the second day after delivery, pulse 120. She was leeched freely, purged, stuped, and slightly mercurialized, under which treatment the urgent symptoms subsided, but never entirely disappeared. The pulse continued at 100, and the skin hot; however, she appeared to be getting better until the 25th, just ten days from her delivery, when she was suddenly seized with violent pain in the belly, rigor, vomiting; pulse 140, weak; she sank rapidly, and died in twenty-four hours. I suspected the cause

of death to be the same as in the last case, and an examination of the body disclosed appearances very nearly similar. A gangrenous abscess had formed in the right ovary, which had burst, and poured its contents into the peritoneum. There was intense inflammation of all the abdominal viscera, the intestines exhibiting a cherry red colour, and largely covered by recent lymph. The uterus and vagina were not diseased, as in the former case.

While upon this subject I wish to record a very remarkable case of recovery from an accident similar to those just related. Margaret Grant was delivered in the hospital on the 31st of October. She went on well for three days, when symptoms of inflammation of the uterus and its appendages set in with great pain and tenderness of the hypogastric region, and high fever. These were in a great measure subdued by leeches and mercury, &c., but a swelling and tenderness in the right iliac region, accompanied by a certain amount of fever, continued for ten days, at which time she was removed to Sir P. Dun's hospital, where she remained nearly a month, and was then discharged as well. She continued at home for three weeks, (suckling her child, which was not healthy,) but still complained of a swelling and soreness in the right iliac fossa. At the end of that time the circumstances took place, which I now proceed to relate in the words of my friend, Dr. Houghton, who was at that period attending the practice of the hospital, and undertook the treatment of the case, and to whose bold and judicious practice she is certainly indebted for her recovery.

"On Friday, the 9th of January, her father came running into the hospital, South Cumberland-street, at half past ten o'clock, earnestly requesting that medical aid should be instantly given her, as she was suddenly seized with some inward pain, which left her in a dying state. I went with him to their dwelling in Grand Canal-street. She lay screaming with agony on her left side, with her knees drawn towards her belly. She threw her arms to me supplicating some relief, not

moving, however, any part, except the upper extremity and thorax. Her breathing was entirely thoracic ; she related to me with difficulty, that about half past nine o'clock, (an hour before,) while at stool, having passed a little from her bowels, she was all at once seized with a pain of excruciating intensity at the right side of the belly, about the iliac region. She was placed on the bed immediately, in the opinion of the people present, dying ; she vomited and fainted. On proceeding to examine her abdomen, she screamed to keep off my hand from touching her ; it was swelled up into a round form, especially at the lower part, where she could not bear the least touch.— This sensibility extended up to the epigastrium, decreasing, however, from below. Her pulse at this time was about 80 ; her hands were cold ; and her face, besides expressing intense pain, was somewhat sunk. She got a strong opiate and her feet were put into very hot water. I saw her again in an hour and a half ; she had vomited the draught ; her pulse had risen and become stronger ; and the abdominal soreness had rather increased. I then bled her *ad deliquium*, which ensued when about a pint of blood was drawn. She complained of a scalding pain in both the rectum and vagina, which probably was caused by the inflammation invading the part of the peritoneum lying between those parts. At half past one o'clock she commenced taking pills, consisting of five grains of calomel and one of opium, every half hour, and a blister was placed over the abdomen, to be dressed with mercurial ointment in ten hours. Towards evening, at half past seven, she appeared in less pain ; the pulse was about 140 ; same position of knees ; breathing entirely thoracic ; had passed urine under her with great pain ; no evacuation from the bowels. Dr. Churchill saw her with me this day.

“ Saturday, 10th.—Dr. Beatty came with me. Her pulse was about 130 ; pain in belly had much abated ; had not slept any. Has taken fourteen grains of opium and 3*i* of calomel ; no sign of mercurialization ; slightly drowsy ; voice louder.—

Examination per vaginam discovered os uteri of a natural size, not tender, or in any other respect different from usual. Ordered her to take the calomel and opium every second hour. The blister rose well, and was dressed with the ungt. hyd. fort.

“ 11th. Appears to be decidedly improved ; face expressive of less suffering ; belly bears pressure with little pain ; pulse 126. Vomited the medicine ; can take but little drink ; tongue white.

“ Repeat the medicine, a large injection with turpentine, salts, tinct. jalap, &c. to be thrown up.

“ 12th. Improvement continues ; pulse 108, strong and regular. Injection brought away a large dejection of black faecal matter ; passes water freely ; complains much of severe stitches in the right hypochondrium ; bears pressure over the abdomen ; vomiting continues.

“ Omit the medicine ; stupe the place where the stitches are with turpentine, and afterwards rub the part with the ungt. hyd. fort.

“ 14th. There commenced yesterday afternoon, a dribbling from the vagina of purulent matter, which continued through the night, and at five o'clock this morning she was seized with pains resembling those of labour, during which gushes of matter issued from the vagina, and still continue to occur at intervals, accompanied by pains. She is more decidedly improved to-day than she has been yet ; the face is much better ; pulse 104, full and strong ; bowels copiously evacuated ; passes water freely ; got some sleep in the night for the first time since the accident. Mouth becoming sore and fetid ; the pain and stitches in right hypochondrium much relieved ; ordered

“ Hyd. c. creta, et Puvl. Rhei à à gr. iij. 3tia q. q. hora, and a draught with Aq. Menth. pip. and Tinet. Opii. gutt. xxx. at bed time.

“ 15th. Continues to improve ; pulse 100, regular ; pain on pressing abdomen generally quite gone, but still considerable

on pressing over the uterus; mouth sore; has been in a profuse perspiration since yesterday without any rigor. A flannel swathe applied round her belly.

Rept. Enema Terebinth. et Hapstus.

“27th. I have not seen her for some time, (being myself unwell.) She has been taking the anodyne draught at night since, and is now decidedly advanced to recovery. She still has some pain on pressing the region of the uterus, and there is a fulness with hardness, particularly on the right side. She is much troubled with tenesmus, accompanying the discharge of gelatinous matter, sometimes tinged with blood; her face is much improved. This day the discharge from the uterus, having ceased for ten days, recommenced. Ordered to use an injection, *per vaginam*, of decoct. chamaem. and an anodyne enema. From this date her amendment was progressive.

“May 2nd. I called to see her to-day. She is grown full and strong, but the belly is somewhat swelled, and some tumour still remains in the region of the right ovary, or to speak less inferentially, in the right iliac region. She has never menstruated since, although the milk was stopped at the time of the accident, now nearly four months ago. She speaks of going out to Malta to join her husband, who is a soldier stationed there.”

From this very accurate description of the case, there can be little doubt that a burst of some kind had taken place into the peritoneal cavity; and looking to the previous history, there is strong ground to presume that it was an abscess of the uterus or ovarium that had given way, probably the latter. The recovery is worthy of record, in as much as it shews the efficacy of bold and scientific practice. The quantity of opium and calomel administered was very great, and I think it is likely that either of them alone would not have been successful.—The opium was given in accordance with the views of Dr. William Stokes, as set forth in a former number of this Journal; but it appears that the salivation by the mercury completed the resolution of the inflammation, and probably the

absorption of the effused fluid. The discharge of pus from the uterus, at a subsequent period, shews that more than one abscess had existed.

The sixth case of death was that of a wretched female, who was found by one of the pupils of the hospital, lying on a clay floor, in a damp cellar, in labour, and apparently dying of pneumonia. He had her conveyed to the hospital, where she was delivered, and died on the second day after. Both lungs were found extensively affected with pneumonia in the third stage.

The seventh fatal case, was from inflammation of the uterus after turning, the particulars of which have been already detailed.

Instrumental delivery was effected in four cases, in two by the perforator, and in two by the forceps.

Both cases in which it was found necessary to diminish the size of the head, occurred in first labour. The women, as well as those who were the subjects of the forceps operations, had a very close resemblance in their external configuration; one which I have generally found to prognosticate a difficult labour: viz: a low, squat, thick set, brawny frame, with broad shoulders and thick limbs, short stumpy fingers, as if the last joint of each was cut off; very rigid muscular fibre, and nates so large as to render examination per vaginam difficult. Such cases seldom terminate without much trouble and anxiety.

The first case occurred in a woman of the above description, aged thirty, pregnant of her first child. The os uteri was more than forty hours dilating, although the pains were very severe and true, during the whole of which time her pulse remained moderate and her belly without tenderness. At the expiration of fifty hours her pulse rose to 100; she became restless and unmanageable, insisted on getting into another bed, her belly became tender, and her stomach rejected drink. She was bled to 16 oz. with the effect of calming the delirium, and causing relaxation of the os uteri. Finding that notwithstanding very strong pains, the third part of the head only had

passed the brim of the pelvis, at the expiration of fifty-nine hours, and that the rapidity of the pulse and soreness of the belly were increasing, I determined, in consultation with Dr. Montgomery, to deliver her with the perforator, which was done accordingly. In this, as in the subsequent case, I found my fingers, passed into the evacuated skull, the most efficient mechanical agent for the extraction of the head. The patient suffered a good deal from inflammation of the vagina, but she recovered perfectly.

The second case was that of a woman, aged thirty, pregnant for the first time, and possessed of all the unfavourable external characters already mentioned. She was seized with labour pains in the evening of the 24th of December, having been a month previously in the hospital on account of false pains for two or three days. She continued in labour all the 25th, and on the 26th she came into the hospital. On her arrival the pains were severe and frequent, and the abdomen was observed to be remarkably prominent, with the uterine tumour very high. There was great difficulty in making an examination, owing to the size and rigidity of the nates, but at length the os uteri was discovered very high up, and dilated to about the size of a sixpence. The edges of the orifice were particularly sharp, giving the impression of an aperture punched in a very tense and thin membrane. The membranes were entire and the head could be felt.

27th. The pains continued all night, depriving her of sleep: no alteration in the condition of the parts; no impression on the os uteri or head during a pain. Ten o'clock, p. m.; no change; bowels have been well freed. Ordered an anodyne with tinct. opii gutts. xxx.

28th. Matters remained in precisely the same state; pains severe; no sleep; pulse 82; os uteri not dilating.

V. S. ad 3xvi.

29th. Pains continue severe and regular, her cries have been unceasing for the last two days; os uteri no more dilated, pulse 98.

Having failed to cause a cessation of the pains, or relaxation of the os uteri, by the opium and bleeding; and finding that no effect was produced on the head by the uterine action, I considered that the fibres of the uterus must be acting irregularly from over distention; which opinion was strengthened by the great size and prominence of the abdomen. I therefore punctured the membranes, and gave exit to a large quantity of liquor amnii. Four p. m.; os uteri dilated to the size of a half crown; head more advanced, though still very high; anterior fontanelle to be felt behind the pubis, and the sagittal suture, running directly backwards. Ten p. m.; no advance, tumour forming on the head; pains as before.

30th. Passed a severe night of labour; os uteri more dilated, its edges thick; tumour of scalp very large, but the bulk of the head had not entered the brim of the pelvis. She was greatly exhausted; the pains were weaker; the abdomen tender; and the vagina becoming dry, hot, and painful. She had now been 136 hours in severe pain, and had had no sleep for five nights; there was no prospect of natural delivery, so on consultation with Dr. Montgomery, it was judged imperative to deliver her by the perforator, which was done accordingly, and a large child was extracted with the face to the pubis. In this, as well as in the former, and several other cases of difficult labour that occurred, the fluid that was discharged from the uterus, immediately after the child, was thick, of a dirty yellow colour, and excessively foetid, resembling the contents of an unhealthy abscess, and in great quantity. The waters discharged when the membranes were punctured, were of the usual limpid appearance, and it is not easy to account for so remarkable a change in the characters of the fluid; but it is one which I have frequently remarked in difficult labours.—The woman recovered after suffering a good deal of inflammation of the uterus and vagina, which was subdued by blood-letting, mercury, stupe the belly, and syringing the vagina.

The first of the forceps cases occurred in a woman, aged

thirty-six; in labour of her seventh child, two of which had been still born after long labour. She was forty-eight hours in strong labour, at the end of which time the head was firmly jammed in the pelvis, the greater part of it having passed the brim; her pulse was 120; her strength failing; and the pains diminishing. I applied the male and female forceps not without some difficulty, in consequence of the tightness with which the head was grasped by the pelvis; and by slow degrees I succeeded in dislodging it, and extracting the child still born. This woman, like the others, had a good deal of inflammation of the vagina, and incontinence of urine for some days. I could not discover any breach of the bladder or urethra, and she went out of the hospital nearly relieved from this affection. She has since appeared at the dispensary, and states that she retains her urine perfectly, unless when making any great exertion, when some of it escapes.

The second forceps case was that of a woman, thirty years of age, pregnant for the first time; she succeeded, after severe labour of forty-eight hours, in passing the greater portion of the head through the brim of the pelvis, but at the end of that time her belly became tender; her pulse rose to 120; she vomited dark greenish matter, and the pains failed. Unwilling to expose her to greater risk, I delivered her with the same forceps, of a child measuring twenty-one inches, and large in proportion, and although it was her first birth, there was not the slightest crack in the perineum. She recovered without any unpleasant consequence.

There was one case of convulsions, which occurred in one of the twin cases. The woman was pregnant for the first time, and was in the hospital for a fortnight previous to her delivery, having come in with false pains. Her legs swelled enormously during that time, having all the appearance of phlegmasia dolens without the pain. Labour commenced at eleven o'clock, A. M., and continued slight during the day, but as I afterwards learned, there were faint convulsive motions of the limbs from

time to time. She continued in labour until one o'clock the following morning, when she was suddenly seized with a severe convulsion, upon which I was sent for. The fits succeeded each other with such rapidity, that she was recovering from the fourth when I saw her; I found the pulse 120, full and strong; the head of the child in the pelvis, but the external parts not relaxed. I bled her to 3xx.; cut off the hair, and applied cold to the head. The external parts relaxed; the pains continued, and the head passed down to the perineum. She had another convulsion at three o'clock, when she was bled to 3xvi. I attempted to deliver her by the forceps, but she was so restless, that I found it impossible to apply more than one blade of the instrument, which I used as a lever with some advantage. At four o'clock, she had another very severe convulsion; the vein was again opened, and 3xvi. of blood removed. At five o'clock, she was delivered of a large boy, still born. It was soon discovered that there was a second child, presenting likewise with the head, and not wishing to allow her to pass through a second labour, I passed my hand and turned the child, which was with much difficulty extracted dead. The second child was born at six o'clock; the placenta came off readily, and immediately afterwards she had another severe convulsion. I now threw up an enema composed of gruel, spt. terebinth. 3i. tinct. assaf. 3ij., tinct. opii gutts. l., after which she fell asleep; and did not waken for several hours. She recovered without any bad symptom, but never recollects any part of her labour.

Another of the women who bore twins, continued to go on well after delivery for some days, when her pulse became fast and small, her tongue loaded, and her countenance sunken and indicative of general constitutional disturbance. Accurate examination could detect no tenderness in the uterine region, and there was no local symptom that could account for the general distress. At the end of two or three days she complained of some soreness about the right buttock, and on examination a

small black spot was perceived over the tuberosity of the right ischium, surrounded by a broad base of a deep red colour. This continued to spread from day to day, the constitutional symptoms increasing in severity, pulse 130, small and feeble, tongue dry and brown, countenance ghastly, stomach irritable, and diarrhoea. She was supported by wine, bark, and Dover's powder, and at the end of a week more, a large slough began to separate. This extended deep into the cellular substance of the pelvis, and at length came away, leaving an unhealthy cavity into which a large orange could have been passed. The sore was dressed with the warm dressing, and the constitution began to rally, but in some days it was found that feculent matter was mixed with the discharge. This continued to pass for a fortnight longer, during which she remained in the hospital, and then finding that her general health had improved, I proposed her removal to a surgical hospital. To this she objected, and preferred going to the country, since which I have not heard any thing of her.

Among the cases of female diseases admitted into the hospital, there were two of prolapsus uteri, both of which went out cured. In one of these the disease had existed fourteen years. There was complete prolapse of the uterus and inversion of the vagina; the bulk of the tumour being equal to that of an infant's head. The urinary bladder was also included in the sac, having followed the anterior part of the vagina in its descent. This was evident on passing a catheter into the orifice of the urethra, (which was readily perceived at the upper part of the tumour). The instrument, instead of passing upwards, took a direction downwards, and its point could be distinctly felt towards the lower part of the tumour. A round orifice at the inferior portion led to the os uteri, situated about half an inch above it, and the body of that organ could be readily distinguished by grasping the tumour. The mucous surface of the vagina was covered with cuticle, and thrown into rugæ, resembling those on the scrotum; but the anterior and lower portions

were ulcerated by the passing of the urine over the surface. The whole appearance of the disease exactly resembled the representation given by Madame Boivin, in her splendid work on diseases of the uterus. The patient complained of very severe dragging pain in the loins, and her health was a good deal impaired. She was put to bed, and ordered not to rise. The tumour was frequently stupefied, and she got some mild medicine to regulate the bowels. By pursuing this plan for a week, the ulcerations were much improved, and the tension and bulk of the tumour were diminished. I then tried to reduce the prolapsed organs, and succeeded without difficulty; but of course they descended on going to stool. The next day, I passed a large ring pessary of box-wood, and kept her still in the horizontal position. No uneasiness followed the introduction, and she left the hospital at the end of ten days. It is now more than twelve months since the instrument was applied, she has come frequently to the hospital since, and still remains quite well.

Three cases of severe menorrhagia were admitted into hospital, one in an unmarried female, the others in married. They had all been of long standing; in one of the latter the disease had existed for eight years; this woman's constitution was reduced to a very low ebb, by the constant and profuse losses of blood; her countenance, lips, and tongue, were pale, verging to a lemon colour; her legs oedematous; her skin cold, and pulse feeble, with nervous palpitations. I made an accurate examination of the os uteri, but could not detect any organic disease. She was put to bed, and was ordered a cold enema to free the bowels, and then a draught with gr. iv. of acetate of lead and a drachm of dilute acetic acid, three times in the day; to throw into the vagina, by means of Clarke's female syringe, a strong solution of alum* every four hours;

* For two or three days she employed a piece of solid alum, passed into the vagina, with marked benefit.

and to keep cloths, wet with cold water, constantly applied to the pudenda. Under this treatment the violence of the discharge was arrested, and in the course of a few days she was allowed nourishing diet. The flow of blood reappeared two or three times, during the ten days she remained in the hospital, but never so profuse as before, and was checked by the same means. I then put her on the use of the sulphate of quinine and sulphuric acid, which had a marked effect in restoring her constitution, and arresting a slow draining of pale blood from the uterus. It is now six weeks since she left the hospital, but she attends at the dispensary to get her mixture renewed, and is in better health than she has been for years.

Two women were admitted with mammary abscess; both of whom had been delivered in the hospital. In one of these, the disease supervened at a distance of two months after delivery, and was very chronic in its nature. When she presented herself, it was manifest that matter had formed; the breast was enormously swollen, and felt doughy under the fingers; there was not much pain or redness, and the constitutional symptoms were not severe. It was nearly a month from the time she had first felt pain and hardness in the breast. Under these circumstances, seeing that resolution was not to be expected, my endeavour was to bring the matter forward, and as there was no evidence of pointing at any particular part, I applied a blister over the breast, excepting the nipple. This had the effect of stimulating the abscess, and in two days fluctuation became distinct, at the inner and inferior part. A puncture was now made, and nearly a pint of healthy matter was discharged; a poultice was applied and firm pressure made over the whole. The quantity of matter that escaped afterwards was very trifling; the poultice was laid aside in a day or two, and by continuing the pressure the breast was healed, and she left the hospital in a week.

The other case occurred in a woman who had suffered from mammary abscess, after the birth of her three former children.

About a week after delivery in the hospital, the left breast, which was the one formerly affected, became very much inflamed. She was ordered half an ounce of the tartar emetic solution, (two grs. to 8 oz. water,) every hour, which produced nausea, and was continued four days, at the end of which, all the inflammatory symptoms subsided, and she was discharged well. She continued at home for a fortnight suckling her child, and occupied about her domestic concerns ; and then returned to the hospital, complaining of pain and tenderness in the same breast. She had perceived it becoming painful for some days, but postponed applying for relief until the inflammation had reached its present height. The breast was now very red, swollen, and painful ; her pulse fast, and her countenance betrayed great anxiety and suffering. I was apprehensive that the disease had proceeded too far to be arrested, nevertheless being desirous of giving her a fair chance, she was taken into hospital. Her bowels were freed by sulphate of magnesia, the antimonial solution was recommenced, and warm stupes were applied. The day following, finding the stupes give no relief, a lotion of acetate of lead was applied, from which she felt much comfort. The other treatment to be continued. Notwithstanding all our efforts, matter was formed, to which I gave exit on the eighth day after her readmission. Pressure was applied to the breast, and in the course of a few days, all discharge ceased. She left the hospital, and continues to give suck from that breast.

This case is interesting, inasmuch as it shews that the timely administration of the tartar emetic had the effect of arresting the disease in the first instance, in a breast greatly disposed to inflammation ; and I have little doubt that if the second attack had been met in time with the same remedy, the termination by suppuration would have been averted. I am induced to speak thus strongly, from the general success with which this treatment was followed, in several cases, when early resorted to.

A case of suppuration of the breast presented at the dispensary, in a girl thirteen years of age, who had never menstruated. It came on slowly, without any previous injury, and healed kindly, after a large quantity of matter was discharged by puncture.

Two cases of irritable uterus were admitted, both of them occurring in women who had borne children. The pain was very severe, occupying the loins, groins, and pubis, and shooting down the thighs, with a sensation of weight, and bearing down, that was very intolerable; the general health was much impaired owing to the constant suffering; no organic disease was to be detected. Rest in the recumbent position, frequent stupefying to the hypogastrium, and syringing the vagina with warm water, together with frequent doses of hyd. c. creta and Dover's powder, was the treatment pursued; under which, the symptoms gradually yielded, and they both went out much relieved.

A case of prolapsus vesicæ, in a young woman who had borne one child, was sent to me by a professional friend and taken into hospital. The tumour was about the size of an orange, projecting from the anterior wall of the vagina, which was carried down with it and formed its covering. The mucous coat of the vagina was dry, wrinkled, and covered with a cuticle where it protruded beyond the external parts. The patient stated that the disease had commenced and progressively increased since her delivery, about three years ago. She was not incapacitated from following her business as house-maid, but she felt at times a good deal of uneasiness and distress in the loins and pubis. She was kept in bed for a month, during which time warm stupefying at first, and afterwards astringent lotions were employed. Under this treatment the tumour diminished, and the uneasy sensations described greatly abated. I was desirous of affording some more permanent relief, and tried the sponge pessary, but it created so much irritation that she was unable to bear it. After remaining two months in the

hospital, she returned home much relieved, but it is to be feared that a return to her usual occupation will occasion a relapse.

A woman presented herself at the dispensary with a tumour projecting beyond the external parts, as large as an infant's head, covered by the mucous membrane of the vagina, which was coated with cuticle. On examination, this was found to be a hernia, protruding from the back of the vagina at its lower part. By placing the woman recumbent, and applying pressure, the whole could be returned, but it passed down again on coughing, or assuming the upright position. I recognised this woman as a patient I had seen twenty years before, in the Richmond hospital, with her present disease. I took her into hospital, and after a week's rest in bed, I introduced a large globular wooden pessary, but the next day I found the hernia had passed down below it, so as to render the instrument worse than useless. It was then withdrawn, a T bandage with compress substituted for it, and the patient left the hospital.

Several instances of parulent ophthalmia occurred in children born in the hospital, without the existence of gonorrhœa in the mothers. Some of these were very severe, but all recovered perfectly. The treatment adopted was dropping a saturated solution of acetate of lead into the eye, twice a day; and keeping a fold of fine linen, moistened with cold water, constantly applied. Many got well by these means, but some of the more obstinate required the solution of nitrate of silver, 10 grs. to the oz., for their complete removal. In no case did I find it necessary to apply leeches. Alterative doses of hyd. c. creta and rhubarb were given from time to time.

An example of that rare disease, hydrocele of the neck, presented itself in one of the infants. It was not observed until about a week after it was born, and was then about the size of a nut, situated immediately below the middle of the left clavicle. It has continued to grow rapidly, and is now at the end of six months as large as a small orange. The coat

are thin and diaphanous, the sac not tense, and no pain appears to be felt in it. I was unwilling to interfere with it during the infancy of the child, but I propose passing a seton through it at some future period.

Several cases of tinea capitis presented themselves at the dispensary; in all of which a speedy cure was effected, by treating the disease as inflammatory in the first instance. The means employed were, cutting the hair close to the scalp, not shaving it; and covering the entire head with a linseed meal poultice, which was kept on night and day. Alterative doses of hyd. c. creta and rhubarb were given, and the diet regulated. By following this coarse method of the cases got well, without any other application, in the course of a fortnight. In some, when all inflammatory appearance was subdued, the scalp was rubbed with an ointment composed of equal parts of ungt. hyd. nit. et ungt. sulph. which soon had the effect of removing the disease. But it was found that all stimulating applications applied at first, had the effect of aggravating it.

Hooping cough has been very prevalent during the last six months, and several very severe cases of it were brought to the dispensary. This is one of the disorders which the children of the poor have with great severity, in consequence of the exposure to cold in the early stages, aggravating the bronchitis, with which it always commences. I have never yet met with a case of hooping cough that was not attended with inflammation, more or less severe, of the bronchial mucous membrane at its commencement. A disregard to this stage, or the adoption of means calculated to increase rather than diminish its violence, is a great reason why the disorder is sometimes met with in so aggravated a form; and there is no measure so calculated to do mischief, as the free exposure to all weather. To this the children of the poor are of course greatly exposed. In some of those cases in which bronchitis had gone to a great length, before application for relief, the whole attention was directed to this complication. Close confinement, depletion, calomel,

and hippo, and blisters, formed the chief ingredients in the course of treatment. After the inflammatory stage was got under, the spasmodic was attended to, but great caution was observed in passing from the treatment proper to the one, to that suitable to the other. The mixture which was introduced into practice by the late Dr. Beatty, and the formula of which has been given in one of the early numbers of this Journal, has been employed with great success in the latter stage. It is as follows :

R. Tinct. Cinchon. Comp. 3v.
Tinct. Opii Camph.
Tinct. Cantharidis à à 3ss. m.

Of this a teaspoonful is given three times a day, in an ounce of flaxseed tea ; and to a child of three or four years old, a dessert spoonful ; and up to a table spoonful for a dose, to children of ten or twelve. It is evident from the nature of this mixture, that its use cannot be commenced while any inflammatory action is going on. But if the proper time be selected for its administration, its efficacy in arresting the spasmodic cough is often surprizing. It generally puts an end to the disease in a week when given judiciously.

Many other diseases of great interest were met with, but as this Report has exceeded the limits within which I intended to have confined it, I must reserve the consideration of them for some other occasion.

BIBLIOGRAPHIC NOTICES.

Nouvelles Recherches sur la Structure de la Peau. Par M. G. BRESCHET, M. D., Chirurgien Ordinaire de l'Hotel Dieu, et Consultant du Roi, Chef des Travaux Anatomiques de la Faculté de Medecine de Paris, &c., et M. ROUZEL DE VAUZEME, M. D., &c.—Paris, 1835.

New Researches on the Structure of the Skin. By M. G. BRESCHET, M. D., Surgeon in Ordinary to the Hotel Dieu, Consulting Surgeon to the King, &c., and by M. ROUZEL DE VAUZEME, M. D., &c.—Paris, 1835.

THIS memoir of M. Breschet impresses us with a new and higher idea of the human integument. His minute investigations of its structure give more enlarged views of its component parts, of its great vitality, and of the extreme sensibility, it possesses from its nervous development. Now as deductions with regard to pathological conditions, will be more free from error according as physiology becomes more clear and defined, valuable improvements in the treatment of diseases generally, and particularly of those of the skin, may be hoped for, if the continued researches, which the author promises, on the skin and mucous membranes, be as happily conducted. M. Breschet not only sends forth new light on the subject, but withdraws it from the obscurity in which it was left by the imperfect observations of his predecessors, whose works, from Malpighi to Gaultier, he examines with candour, giving them due credit where their views are correct, and disproving their errors by anatomical facts.

In his arrangement, the author does not confine himself to the four divisions of skin, into derma, papillary tissue, rete mucosum, and epidermis; and though French scientific writers are noted for a cosmogony of names, and that it forces itself on our feelings how poor St. Bartholomew must have been two degrees more of a martyr than is usually thought, yet we do not find fault with the author's adding two more heads in his clas-

sification; on the contrary, they are very opposite to his explanation of the subject; they are as follows:

“ 1. *Derma*, or tissue enveloping and protecting the capillary blood-vessels, lymphatics, nervous filaments, and the parenchyma of the organs contained in the skin.

“ 2. *Papillæ*, or organ of the sense of touch.

“ 3. *Transpiratory apparatus*, composed of glandular parenchyma and sudoriferous canals.

“ 4. *Absorbent apparatus*.

“ 5. *Organs producing mucous matter*. Those are composed of a glandular parenchyma in the derma and excretory ducts, that deposit the mucous matter between the papillæ.

“ 6. *Organs producing the colouring matter*, composed of a glandular parenchyma, situated a little below the papillæ, and having excretory ducts that pour the colouring matter on the surface of the derma, where it combines with the mucus above described. The pretended rete Malpighianum results from this combination. Scales, hair, bristles, nails, wool, &c., are the products of this apparatus.”

To each of the above heads a chapter is allotted, and we shall follow the arrangements of the author in our analysis.—We may observe that his experiments, though made on every part of the skin, were directed principally to the skin covering the heel, as being most favourable to the study of structure; while the skin of the whale, as approaching most closely in texture to that of man, is made to illustrate its comparative anatomy. The result of M. Breschet's researches on the derma do not differ materially from the description given of it by authors, but he considers that the term *inextricable* can no longer be applied to that tissue.

“ *Nervous tissue or papillary bodies*. The filaments proceeding from the nervous trunks of the sub-cutaneous cellular tissue, subdivide ad infinitum; as they approach the derma they can be dissected into the latter tissue, but from their great fineness, and the opacity of the derma, they are lost in its substance. But when accustomed to it, one can distinguish and isolate, among the excretory ducts of the surface of the derma, very thin bundles of nervous filaments, directed towards, and penetrating the base of the papillæ.

“ These shoots are ranged in continuous series, commonly bifid or trifid, separated transversely by the intervals destined for the course of the sudoriferous canals, and following the course of the furrows from which the horny matter is secreted; their form is that of a little cone, the base of which expands in the derma, and the summit terminates in a rounded point. Each shoot penetrates the horny matter, as a sword in its sheath, so that the internal surface of the epidermis represents the number and disposition of the papillæ. If

force be used in tearing off the epidermis, these papillæ remain attached to the derma.

" The direction of the papillæ is oblique, and slightly inclined within the epidermis. Besides the neurilema which they borrow from the derma, the horny matter furnishes them with a membrane that covers them like a hood ; in the heel they have a very thick protecting layer of horny matter : there is no aperture at their tops to indicate a canal within them. On tearing off the dark coloured epidermis from the skin of the whale, those papillæ are seen very distinctly unsheathing themselves from its substance. The papillæ in man vary from this latter in a slight modification of form only. In the whale they are several lines long ; their base, radiated into the derma, is channeled, but the summit is rounded, presenting the form of a drumstick. After having penetrated nearly through the epidermis, they become slightly inclined at the top.*

" These nervous projections, though proceeding in twos and threes from a common base, are all kept asunder and covered by a peculiar web, furnished by the horny tissue, and which moulds itself to their outline.

" The external colour is of an opaque pearly white. When highly magnified, undulating striæ appear through the neurilema, along the body of the nerve, becoming less apparent towards the summit, where they reunite and terminate in concentric semi-circles. Its surface here is smooth and even. There is no prolongation from it to communicate with neighbouring tissues : we have dissected it, torn it, submitted it to the action of reagents, &c. A white, dense, resisting tissue, easier torn than broken, was the result of our most minute microscopic observation. For a long time we found it difficult to separate the striæ into fasciculi : yet we have been able to discover a nutrient vessel going to each. In man, there are at least two vessels to each, that join in an arch, and which, after being injected, become very evident if a transverse incision of a papilla be made ; and a pulpy whitish matter can be detected in the centre of its neurilema."

In speaking of the horny papillæ on the tongue of the ox, M. Breschet considers them as organs of *touch*, and that the papillæ dedicated to taste lie in their interstices, that the former are provided with many layers by the epidermis, while the latter are furnished with a very slight envelope. He continues :

" The examination of the part of the derma where the papillæ end, would leave no doubt that they are nervous ; for the same order is to be met with in the interior of the derma as at its surface : its

* As seen in the plates, they resemble very much, in shape, the contents of the point of a lobster's claw.

inequalities resemble the ridges of a field, the projecting lines are the nerves; in their interstices are the sudorific canals, and the filaments of the inhalant vessels; in the bottom of the ridges is found the source of the horny matter; if the sense of touch be denied to these papillæ, we know not what part of the skin can be considered as the organ of that function.

"The nerves going to supply the skin may be looked on in three points of view; 1. in the subcutaneous layer, where they do not differ from the nerves of the spinal canal; 2. in the depth of the derma, where they become soft, flexible, and capillary; 3. at the surface of the derma, where they are transformed into symmetrical papillæ. Looking at these three states of the nerve, the necessity of such an arrangement becomes evident. The subcutaneous nervous filaments could not become the organs of a sense when in contact with the horny matter, without having undergone some change in their primitive dispositions. This change takes place in the derma, and beyond it the nerves rise outfitted for the performance of new functions."

M. Breschet considers that the nerve parts with its neurilema at the derma, as the optic nerve does entering the sclerotic, and that the projecting papillæ take a new envelope from the outer surface of the derma; that the mere nervous pulp does not, of itself, constitute the sense of touch, but that as in the sense of hearing, or of sight, there is an apparatus, all the parts of which must be in unison to be perfect: so for the perfection of the sense of touch there must be

"(A) *A principal part*; 1. the tactile nerve terminated in a rounded point.

"(B) *Accessory projecting parts*; 2. the derma enclosing the nerve in its interior.

"3. The papillary neurilema furnished by the derma.

"4. A peculiar modified tissue from the horny tissue, the organ of protection.

"5. A thin layer of epidermis covering the membrane of the papilla, and indispensable to the exercise of touch.

"If any one of these be wanting, touch cannot be exercised, and the derma, neurilema and proper epidermic membrane are to the papilla, what the complicated apparatus of sight and hearing are to the optic and acoustic nerves. The analogy goes farther, for the optic and acoustic nerves, on entering the structure of the eye and ear, undergo the same change as the tactile nerve entering the derma, with this difference, that the two former remain in their cavities, where light can penetrate to the one and sound to the other, but the nerve of touch must advance as it were to meet impressions.

"*The Sudoriferous Canals.*—This organ occupies the thickness of the skin from the interior of the derma to the most superficial layer of the epidermis, where it has an exit. It is composed of a parenchyma for secretion and an excretory duct.

"This parenchyma is situated in the substance of the derma, hav-

ing numerous capillaries surrounding and attached to it. Its form is that of a sac, from whence issues a spiral canal that runs through the derma, and comes out of it by an infundibulum or tranverse fissure, situated between the papillæ; thence it takes an oblique course in the thickness of the horny layer, in form of a corkscrew; its termination at the epidermis is indicated by a light depression or pore, that is observed on the back of the epidermic lines.

“ The canal seen through the epidermic layer is round, its structure resembles the horny tissue, from which it is hard to be distinguished. From its spiral form its mouth is nearly parallel to the surface of the skin; this opening is closed by the apposition of the superior and inferior parietes of the tube. The oozing out of the first drop of sweat is preceded by a raising up of the epidermis like a valve.

“ If we separate the epidermis from the derma in a bit of skin that has been macerated, we can see with the naked eye these excretory canals, unrolling and stretching out like the threads of a spider's web. When viewed with a microscope they present a central canal and a surface covered with horny matter. On leaving the derma, the spiral tubes are accompanied by an inhalant vessel, which enters the infundibulum. These spiral filiform tubes, when laid on a wet glass, coil themselves up, presenting a homogeneous mucous pulp, elastic and trembling like jelly. On shaking the glass an infinity of irregular polygonal scales are detached from them. If the body were warm and in a cold atmosphere, it is probable that these tubes would be seen to steam like a chimney.

“ This corkscrew disposition of the sudoriferous tubes in man is very remarkable; it explains why the epidermis has always appeared imperforate, for in taking off a portion of the epidermis from the dead or living subject, these, when torn, withdraw themselves and close up the opening; the worm of the tube contracts on itself, and it becomes impossible by the naked eye, the microscope, or the most varied experiments, to find out a perforation.

“ On making a sloping incision of the epidermis not reaching as far as the papillæ, you press it between the finger, drops will be found to ooze from it by the fissures of which we have spoken, as the essential oil is made to shoot from the rind of an orange by the same method.

“ Another experiment that proves these spirals to be canals, is the following: if you introduce a little mercury through a hole in the horny matter of the heel, in a direction parallel to the level of the skin, then take off with a razor a very thin slice of the epidermis, and press the mercury with the handle of a scalpel, the metal will find an exit through the sudoriferous canals. But the strongest proof is from the sweat that issues from the pores in the palm of the hand, and the pulp of the fingers; the sudoriferous canals being oblique and spiral, the sweat distils out but never spouts. In the whale the sudoriferous tubes emit their fluid by the raising up of an epidermic valve. We lay the greater stress on these facts, because the pretended exhalant vessels, of which every one speaks, have never been seen nor described by any one before us, without excepting Eichhorn who has principally written on the exterior orifices of these hydrophorous canals.

"Hunter, Bichat, Chaussier, have presumed these canals to be exhalant and absorbent vessels. Beclard says, that the passages for the sweat through the epidermis are completely unknown. Gaultier states, that the exhalant vessels issue from the sanguineous bulbs, (so he termed the papillæ,) which he looked on as centres for the admission of red blood, and from which the black blood, lymph, and fluids are exhaled. Opinions evidently full of error.

"According to Eichhorn, the sudoriferous canals would be at the same time organs of inhalation and exhalation, without belonging to the general vascular system. Yet exhalation is commonly attributed to the capillary system, and absorption to the action of the veins or lymphatic vessels.

"Although the secretions, properly so called, depend on the sanguineous vascular system, the new fluid is not completely formed by the vessels; it is elaborated by a gland, and every where that we have found a secretion, we have observed between the arterial and venous capillaries an intermediate substance, an areolar spongy parenchyma, in fact a gland where the secretion is formed, and from which it is eliminated by an excretory duct. The capillary vessels, destined for this purpose, differ from larger ones only in size. When arteries do not communicate with veins, there must be an intermediate peculiar tissue for secreting the fluid, but no where have we met with an organ which was in turn an instrument of exhalation or secretion and an instrument of absorption. For this reason the opinions of Eichhorn, on this part of the subject, appear to us erroneous, though his memoir is in other respects of high interest.

"In 1717, Leewenhoek announced that he had discovered the pores in the skin by aid of a microscope. But the most credulous can scarcely believe in the existence of 14,400 openings in a square line of cutaneous tissue, while Gaultier makes but six. Monro looked on the spiral tubes to be nervous; Fontana speaks of them, but does not tell what their office is; Humboldt thinks they depend merely on the folds of the skin; Major makes two sets of pores upon the external surface of the epidermis, one for transpiration the other for absorption.

"Here M. Major confounds two very different things; 1st, we are of opinion that the inhalants have no orifices on the external or internal surfaces; 2nd, that the oily fluid, of which he speaks, for the protection of the epidermis, proceeds from the follicles, which are very distinct from the sudoriferous pores. But the observations of Albinus, Meckel, and Cruickshank, have not been successful in seeking the discovery of those pores of the skin, nor were those of Humboldt, though made with a microscope which magnified 312,400 times. Seiler and Beclard have been equally unsuccessful; Blumenbach, Meckel, Rudolphi, &c. not admitting the existence of sudoriferous canals nor orifices for these conduits at the surface of the skin, pretend that they are not necessary."

The remainder of this chapter is occupied in proving claims to priority of discovery; for it seems that M.M. Wendt and

Purkinje were occupied nearly at the same time in similar researches; but their investigations were limited to the epidermis, and though they discovered the spiral canals, M. Breschet alone recognized their functions, and the glands which secrete the sweat. And in September, 1834, the latter asserted his claims, without opposition, before the congress of physicians and naturalists at Stuttgart; amongst those present were, Tiedemann, Froelip, Strauss, Rapp, Lobstein, &c.

“**APPARATUS OF INHALATION.**—To study this apparatus, we must take off a very thin slice of the epidermis; it must be chosen soft, white, and as it were friable, laid on a bit of glass with some drops of water, and when quite free from any foreign body, be then torn asunder with curve-pointed instruments.* The inhalant conduits then appear under the most superficial layer of the epidermis, in the form of isolated radicles, spread out in the horny tissue, and after anastomosing several times, penetrate the derma by the infundibulum of the papillæ, near the sudoriferous canals. All these vascular trunks, disposed symmetrically in the interstitial fissures, which they traverse, communicate in the derma under the papillæ, by canals forming a common plexus, and lying at right angles to the furrows before described. We acknowledge that with all our efforts, we have seen but very few times the termination of the inhalants of the epidermis, yet we have seen them sufficiently often and distinctly enough, to make a drawing of them. We shall, therefore, for the purpose of avoiding error, merely state the result of our observations.

“These vessels, of extreme tenuity, ramify, forming loops in a hard, elastic, resisting substance, are broken with great facility, and generally a few scattered fragments only are found. Viewed with the microscope their colour is white, and silvery; through the parietes of these little tubes, one often perceives a species of diaphragm, which proves, if not a perfect identity, at least an analogy of structure with the lymphatic or venous vessels; sometimes they are knotted, at other times smooth and even, but in general not very elastic. On scratching the surface of the epidermis, you can perceive these vessels often with the naked eye; they are mostly long and dry, and resemble very fine hairs.

“To perceive the entry of these vessels into the derma, you must gently raise the epidermis, as you would to study the sudoriferous canals; then with the assistance of a magnifying glass you will perceive that all the hydrophorous canals are accompanied by an inhalant vessel, and these parts are united in an intimate manner near the derma. The inhalant vessel soon detaches itself, and the sudoriferous canal enters the horny matter by the interpapillary partition, whilst the inhalant vessel diverges on the side of the epidermic fold, more in relief and corresponding to the furrows of the derma.

* By external layer of epidermis he means the cuticle, commonly so called; by epidermis itself, all the horny matter above the derma.

“ On examination by the microscope, these two organs present a difference. The sudoriferous canal is larger, soft, serpentine, and elastic, and covered with little laminae. The inhalant vessel is smooth, silvery, straight, or slightly curved, traversed by a central canal, with small partitions in it. If the epidermis be forcibly taken away, the inhalant vessels break, and there remain only the sudoriferous canals, which are capable of considerable elongation. Another distinguishing mark is, that the inhalants present numerous anastomosing or plexiform ramifications, while the sudoriferous canals never present any.

“ The following experiment would seem to indicate, that the inhalants have a direct communication with the arterial or venous capillary system.

“ A fine injection thrown into the main artery of a limb, will stop at the derma, as we have often found; then if the skin be cut slantwise, and the injected part be pressed from within outwards, with the scalpel, the inhalant vessels will be found coloured, and ramifying, and anastomosing as far as the most superficial layer of the epidermis. The sudoriferous canals and inhalant vessels cannot be dissected throughout their whole extent, on account of the resistance of the horny tissue. But some are seen in fragments under the magnifying glass, others in full by means of injections.

“ We have found the inhalants in the skin of the negro and of the elephant, in the whale, the seal, the turtle, and several fish, they exist even in quills and in the barbs of feathers, and in the prickles of the hedgehog, which are true but modified epidermis. Whatever be the colour of the horny matter, the absorbent and sudoriferous canals and nerves are uniformly white.

“ We have constantly met those inhalant canals in the horny tissue of all sorts of skins that came under our observation, a tissue in which, until very lately, the existence of any vessel whatsoever was denied. But the nature of these canals may be contested. If not absorbent canals, what are they? A different structure from that of the lymphatics of the centre, cannot be a reason for refusing to them the quality of absorbing. Every thing that is without the derma presents a peculiar aspect: the nerves, by the manner they terminate, and the sudoriferous canals by not being in any thing analogous to the other animal tissues. So far we are acquainted with the accomplishment of the sense of touch. It is made known that the sanguineous vascular system does not go beyond the secreting and papillary organs, and that the transpiration is secreted and carried off by the hydrophorous apparatus. We shall see by and by how the horny matter is separated. Proceeding thus by negative induction we arrive at the conclusion, that the canals which creep through the horny tissue cannot be other than inhalants; first, because their radical loops, prolonged to the most superficial layer of the epidermis and their texture, assimilate them to the lymphatics; next, as absorption is one of the manifest properties of the skin, we find in it no other organ which can fill that function.

“ Not having been able to see the commencement of the lymphatic

radicles in the skin, we think that absorption must take place by imbibition from the horny tissue. If we have been able to follow the hydrophorous canals, and to discover their orifices externally, it was different in our observations, on the canals of which we are speaking. These conduits, studied with the greatest care and attention, were continued in part by an inextricable plexus of canals like to themselves, and sometimes these appeared to be but one loop more prominent than the other inflexions of these plexiform cavities, but we never could follow them to their termination in the external surface of the skin, and in those whose extremities we found situated in the substance of the horny tissue constituting the *mucous body*, we have had no means of determining whether they ended in an open mouth or a *cul de sac*. Their frequent arched or looped anastomoses would seem to indicate the latter state. The termination of the absorbent vessels in the intestine, where they take up the chyle, has been equally obscure with that of the inhalant vessels of the skin. There is certainly an identity in the mode of termination and of function in those vessels of the two integuments.

“ Authors present a chaos of conjectures and hypotheses on this head. In general it is supposed that absorption takes place at the surface of the derma, and that it is continued by the capillary meshes either of the lymphatic vessels alone, or of the veins of which they would thus be the origin.

“ We have long sought for the terminations of the inhalant canals, as much for the sake of knowing their characters as to acquire the certainty of not confounding them with the sudoriferous tubes, but never have we succeeded in finding terminating mouths to them as we have done in the latter. We therefore are strongly inclined to doubt that they have open mouths, such as we find in the lachrymal ducts for example. This circumstance in the disposition of these canals may not appear very important, yet it is allied to the doctrine of all the absorptions.

“ Aselli, the first who saw the lymphatics of the intestines, thinks they sucked the chyle into them after the manner of leeches. Bartholin, and Olaüs Rubbeck who discovered the absorbents of the other parts of the body, were of the opinions of Aselli as to the mode of action of these vessels. Malpighi thought that the inhalant vessels had for orifices the intestinal follicles. To make visible the ramifications of the inhalant canals of the horny tissue, we injected the principal artery of a limb and pressed the tissue closer and closer, to make the colouring matter penetrate into the canals of the epidermis. This experiment proves, unless a vessel had been ruptured, that the inhalants do not communicate with the lymphatic system, but with the capillary, and answers to the opinion of M. Majendie, who considers the veins as the chief agents of absorption. Rudolphi has examined the intestinal villi of a great number of animals, and affirms that he found no orifices at their extremities; in that we agree with him, but injections have demonstrated to us that he has been deceived in supposing that they have no blood vessels. Hedwig examined the intestines of nine different animals, the villi of

some had orifices, others none; of forty-five villi of man, six only had orifices; what became of the rest? those that he describes arose from an optical error, like Della Torre, who thought the globules of the blood were rings! Many animals have not villi, yet absorption is carried on; absorption then does not depend on the presence of sensible orifices in the villi. Prochaska and DcUlligen, anatomists who have made the most successful injections, declare that there are no orifices on the villi; A. Meckle is of the same opinion; Lauth has submitted to the most powerful microscopic lenses the villi while distended with chyle; he could see their pointed oval shape and their free extremities, but no orifice. The last named observer thinks, that the intestines examined by Cruckshank, who says that there are orifices in the villi, must have been in a morbid condition.

"The greatest uncertainty still reigns on the mode of origin of the lacteals and on the existence or non-existence of orifices of the villi. Bichat would have done better to descend to simple observation than to declaim against the anatomy of structure, the only thing that can guide us in physiology and pathological anatomy.

"M. Fohmann, who has devoted himself especially to the study of lymphatics, says, that they end in *cals de sac*, and are surrounded by a loose tissue, which forms a connexion between them and the systems of other organs. This view of those vessels supports the opinion of Majendie and Fodera, who suppose that absorption is a true imbibition. Whilst against this opinion we must allow to veins, arteries, and other vessels, the quality of being absorbents, consequently imbibition would go on without end, and the fluids would penetrate all the tissues, and there would no longer be use for particular canals for the blood, the lymph, &c. &c. This form of circulation may exist in animals very low in the scale of existence, but in the superior animals imbibition should have limits, or there should be allowed to the lymphatics and veins a sort of elective faculty of imbibition, above the other tissues. This mode of reasoning would lead us into the fancies and hypotheses of the ancient physiologists, to the neglect of the facts which anatomy gives."

But we must have recourse to reasoning on a subject which is not thoroughly demonstrable by anatomy. Now it cannot be denied that imbibition gives the idea of a substance passing through an opening, and even if accomplished by passing through the parietes of a lymphatic, may not this parietal opening be the orifice of another lymphatic, and so on *ad infinitum*. Hedwig may have been correct in his observations, and some of the larger lymphatics may have presented orifices which could not be discerned in more minute ones. Granting, however, that they have no orifices *at their extremities*, it may not be unreasonable to suppose that there are vessels with open mouths in their parietes, (otherwise we cannot understand what imbibition is,) that discharge their contents into the beautifully constructed canal, whose valves divide the main tube into as many chambers as are suited to the number of parietal vessels, and the length of their course.

... "Apparatus producing the mucous Matter.—We had at first named this apparatus from the horny matter produced by it, but having afterwards recognized the primitive character of this matter to be mucous, and the same in its nature and mode of production, both in the skin and mucous membranes, we have preferred naming these organs muciparous. The mucous matter of the skin unites with the colouring matter, whence result the different tints of horn, hair, scales, feathers, &c.

" In observing the skin from within outwards, we find,

" 1. In the derma,

" (a) A muciparous apparatus, composed of a secreting gland and an excretory duct, discharging the mucus, which by drying becomes horny matter.

" (b) A colouring apparatus composed of a secreting parenchyma and excretory ducts, (squamiform bodies.)

" 2. Without the derma, as result of the mixture of the two secretions.

" (a) The horny matter or epidermis.

" (2). Hairs, the hair, feathers, horns, &c.

" *Muciparous Apparatus*.—At the base of the derma there are seen small reddish glands, which appear with the microscope, knobbed, unequal, and streaked by blood-vessels. They are enveloped in a loose cellular membrane, in an atmosphere of little adipose transparent vesicles, like heaps of small pearls. From the summit of each of these glands, proceeds a tube that traverses the whole thickness of the derma, and opens at the bottom of the furrows before spoken of. This canal is covered by a diaphanous cellular membrane, derived from the contour of the glands. One sees vessels or capillary filaments adhering to the tube and glandular organ, and a considerable sized vessel enters the gland at its base. These canals mostly form a regular colonnade in the substance of the derma. Sometimes the glands are placed at unequal height, and appear to communicate by intermediate canals. The ranges of excretory canals correspond to the length of the furrows, that is to say that they are perpendicular to the plane of the parenchyma, secreting the colouring matter.

" *The Apparatus of the Colouring Matter*.—is situated in the exterior part of the derma, in the depths of the furrows below, and between the papille. Its superior part is surmounted by a great quantity of short excretory tubes; its inferior surface is full of capillary vessels in relation with the excretory tubes of the muciparous glands. Its structure is areolar, spongy, and resisting. This parenchyma and its excretory canals become red very easily, and form a limit to the arterial system, which here brings its last tribute and ceases to exist. We except, however, these nutrient vessels of the papille which rise a little higher. When this tissue is torn there is found an infinity of little filaments from which scales, or uncoloured corpuscula fall off in great quantity. This reservoir of scales exists nowhere else in the derma; we may then look on this parenchymato-glandular tissue as a peculiar organ, penetrated by arterial and venous capillaries, and from which proceed excretory canals which terminate at the

same point as those of the muciparous gland, and pour into the mucus of this gland the granulations of the pigment or the colouring matter properly so called.

“*Excreted Products.*—These products are the epidermis or horny matter. The inner surface of the epidermis presents the form of the outer surface of the derma, as perfectly as a plaster mould does the figure on which it has been laid. This surface is the reticular tissue of Malpighi. It has two divisions, one more in relief and filling the furrows of the derma, to which it is united by the tubes of the muciparous and colouring apparatus; on its sides are holes that give passage to the lymphatic vessels. The other division is the interpapillary occupying the intervals of the bifid papilla, and is prolonged into the interstices of the sudoriferous and inhalant canals, and receives the insertion of the nervous papillæ. On the exterior surface of the epidermis are seen prominent lines, slightly concentric or parallel, which separate the furrows. Examined with a lens, these lines present alternately little papillary eminences and slight depressions, which contain the orifices of the hydrophorous canals. These prominences move on one another like the scales of a fish. The origin of the horny matter is seen very distinctly in the whale, from the contrast of the black epidermis with the white derma. It fills all the space unoccupied by the papillæ. The black matter is excreted at the distance of about a line within the derma, in the latter situation it is found within a capsule, at the bottom of which are little whitish teats; these are the excretory canals of the colouring parenchyma. Its development occurs from within outwards, the matter just secreted drives before it the superior layers, which solidify by degrees. This phenomenon takes place by a successive expulsion of scales and mucus, of which the external layers are always the most compact and least distinct.

“*Structure of the Horny Matter in Man.*—To study this matter we must place a portion of the external layer of epidermis, or of the mucous gluten on the surface of the derma, in a little water. On examining this with a lens, we find among the debris of the *inhalant vessels* and *sudoriferous canals*, an infinity of scaly corpuscula of the form of an irregular trapezium. In a piece of the derma injected with red, the deposit of the horny matter is found to begin where the sanguineous circulation ends in the excretory tubes. This separation is very manifest in the skin of the whale. The horny matter, when secreted, is at first mucous and fluid; it moulds itself, layer after layer, round the papillæ, enveloping and protecting the sudoriferous canals and inhalants, acquiring a greater density the more external it becomes.

“Having thus given a rapid and succinct history of the skin, let us follow the synthetical method, and thus take one glance at all the compartments of this complex machine.

“1st. The blood poured by the arterial capillaries into the parenchyma, secreting sweat, and taken up again by the veins, throws off the matter of the sensible or insensible perspiration. 2nd. The inhalants imbibing, at the surface of the derma or interior of the epidermis, the foreign fluids and molecules of decomposition, to pour

them into the lymphatic canals and into the veins. 8rd. The nerves placed at the periphery of the body as advanced posts, receiving the tactile impressions. 4th. The horny matter secreted and moulded around the papillæ and inhalant and sudoriferous canals, being itself an organ of touch, of defence, and of ornament, and above all, a hygrometrical body, which is penetrated more or less, according to its density, by the fluids with which it comes in contact and thus becoming one of the first organs of absorption or imbibition. 5th. The derma of which we can now form a just idea, supporting, isolating, and protecting the fragile instruments of these multiplied functions.

Two reasons incline us to think that hairs are secreted by glandular organs at the base of the derma, and that they do not spring from a fold of the skin. 1st. We have remarked that the hairs have their bulbs lodged in sheaths, symmetrically arranged at the base of the derma. 2nd. The skin of the heel is unprovided with hair, though the glandular bodies exist there in great numbers. Is it not probable that the horny matter which is elsewhere converted into hair or horn, is employed here in the extraordinary development of the epidermis. This accords with the general observation, that the thinner the epidermis the more abundant is the growth of hair, and *vice versa*.

We have seen that the horny matter is secreted in a fluid state, that this fluid is identical with the hardest horny tissue, that it solidifies the nearer it is to the surface. The wings of the butterfly are only specks of mucus in the chrysalis. It is the passage from the fluid to the solid state in man, that has been considered as a particular body; viz. the pigmentum or mucous network of Malpighi, but this network does not exist of itself, it expresses only the transition of the horny matter to the solid form, and the imprint it receives from the inequalities of the dermic surface. We may use the comparison of wax newly melted, the part of which in contact with the air becomes hard, while the inner part is still in a liquid state.

The discovery of the true composition of the horny tissue has been attributed to Malpighi, who described it under the name of *corpus reticulare*; others after him have called it the *rete glutinosum Malpighianum*; and this word *rete* has so deceived anatomists and physiologists, that they have considered the *corpus reticulare* as a vascular network or interlacing of arteries, veins and lymphatics; even Bichat has fallen into this error, and expresses himself more explicitly on it than his predecessors. Yet Malpighi has never said that the *corpus reticulare* was formed of vessels; in several parts of his work on the organ of touch he speaks of a mucous substance, whose density varies, and which is applied over the papillary bodies by which it is penetrated and traversed. These perforations, pointed out by Malpighi, have given origin to the idea of a network.

Organs of Secretion and Excretion of the Colouring Matter.— The *rete mucosum* of Malpighi has also been considered as the only seat of the colouring matter, which would be secreted by the pretended vascular network, and deposited there in a semi-fluid state; but the analysis of the horny tissue and the knowledge of its mode of production, permit us to present from the facts a theory of the colour-

ing matter of the skin, much more satisfactory than the one hitherto taught. We have remarked that the free edges of the scales is of the same colour as the tint of the skin. The pedicle of the scale and the cellular tissue in which it is implanted, always preserve a white colour, as well as the parts that enter accidentally into the composition of the epidermis, as the nervous papillæ, the inhalant vessels, and sudoriferous canals. The scales then are the only organs in which resides the seat of colour. The coloured pedicular scales of butterflies are implanted in a sort of nervous centre, which leads us to think that the fine network to which the scales of the human skin are attached, is also a tissue containing canals peculiar to the scales; in the whale the latter are evident.

Having through curiosity examined some flowerets in the microscope, we saw that these natural pictures, so rich and varied, were the result of an inlaying of little utriculi of different form and colour, according to their species. Thus, the petal of the rose is composed of little utriculi of uncoloured mosaic; the scales on the primrose are irregular polygons, those of the violet raised and projecting, in the stock gilliflower they overlap like the scales of a fish, &c. As far as the animal and vegetable kingdoms can be compared, the seat and mode of coloration seem to have an analogy in both.

But how is the colour produced? 1st. It is to be presumed that the form of the scale, or utriculus, plays some part in the production of this phenomenon. Can the negro and the cetacea have the scales identical in form? In the European they are of the form of a trapezium. Besides we have remarked that the small articulated pieces forming the petals, differ according to the colour they represent, and the species of flower of which they form a part; can form have any special action in decomposing light after the manner of a prism?

2nd. There is another consideration which probably is not foreign to the creation of colour; viz. that the scale is found with its pedicle in communication, more or less, with its secreting organ, and nourished by a true circulation. This is evident in flowers, whose utriculi contain a fluid, and is proved by the observation that the hair, &c., in animals changes and becomes of a duller colour when the animal is sick. Now the scales in this case may be looked on as organs acting in a special manner on the fluid which is in contact with their pedicle, by means of areolar tissue in which it is implanted. These organs would have the faculty, inherent in their tissue, of shading the colours and of assimilating certain combinations of them. However it may be, the colours are ranged with art in little compartments, so as to produce a true optical illusion. On looking at the petals of a red primrose with a microscope, lighted by a lamp, the flower resembles an illumination of various coloured glasses, each utriculus having the appearance of a little coloured cup. In fact flowers as well as butterflies, or other animals, owe their shades of colour to the form and disposition of the spangles which ornament their epidermis; the feathers of the peacock, the golden wings of the humming bird, may be considered as animal flowers, since the system of colour is the

same in the two organic kingdoms. It is not with pencil and palette that nature does this work ; no, she arrays a combination of mosaics to produce the most charming effects.

" If the scales of the negro's skin differ from those of the white, and if difference of form produce difference of colour, we shall not any longer need have recourse to the contested influence of the sun. That luminary may make the skin more or less tawny, but it has not the power of changing the primitive type of beings ; the negro is black in an absolute manner from the same reason that a European is white. There should be then in all the varieties of the human race a difference in the form of the scales, as we see it in those of fishes and reptiles, a circumstance not as yet pointed out, and in which the physiologist is as much interested as the zoologist. But this arrangement of the little scales could only constitute difference of form ; we must still admit a peculiar colouring matter, and it is this matter, which we believe to be secreted by the superficial glandular parenchyma, that we have described.

" Beneath this organ and its excretory canals there does not exist colouring matter ; the derma is white except at its lower parts, where the vascular network gives it a colour ; all the organs that spring from the derma or traverse it are without colour. But setting out from the second organ of secretion, with which the excretory ducts of the deep-seated glands communicate, we perceive the production of a colouring matter, and we have repeatedly observed coloured globules in the canals that issue from the glandular organ, which tubes we consider as the excretory ducts of the colouring matter. There is effected then a peculiar modification of mucous substance in these glandular bodies of the superior layer, by the combination of a granular colouring matter, whether black, white, or copper-coloured, which demonstrates that the mucous matter and the colouring matter are in their principles two distinct things, although never isolated one from the other when they constitute the epidermic horny tissue.

" In certain animals the horny tissue is loaded with calcareous matter, forming a sort of solid prison in which the animal is shut up. It is easy to understand how the nucleus, subjacent to the cuticle, being developed in successive layers, may occasion the rupture of the older horny envelope, and be prepared to supply its place. Dandriff occurs from the detaching of the worn epidermis, and particularly in spring, comes off in branny exfoliations.

" The surface of the skin is marked out into geometrical figures, forming concentric circles on the pulp of the fingers, sinuous lines in the palm of the hand, lozenge-shaped at the wrist, overlapping like tile work at the bend of the arm, &c. A knowledge of the particular forms of lines adapted to a particular part, would be available to the establishment of a fixed law ; viz. that a form and motion being given, one should know, *a priori*, the disposition that should affect the skin ; thence we might ascertain the relative situation of each constituent part of the skin, and draw consequences from it useful to human and comparative physiology, as well as to pathology. All

the organs placed on the surface of the derma having an oblique direction, every epidermis is necessarily scaly ; the insertion of the hairs point this out.

“ The epidermis then, the protecting envelope to the nervous system and to the whole body, is not an inorganic matter or a mechanical exudation of mucus, it is on the contrary a tissue of very complicated organization, connected with the important functions of exhalation and absorption, from the faculty it possesses of allowing liquids to penetrate it ; and this imbibition or endosmosis would seem to be the point at which absorption begins. The epidermis is allied to vegetable life ; the absence of nerves renders it insensible ; it takes colour, exhales, and absorbs after the manner of vegetables, to compare it with which certainly raises its attributes to a far higher rank, than to call it dead matter as some have done.”

We cannot introduce the retrospect of the different opinions of physiologists, who have written on the skin, unless we were to give a translation of the whole of this memoir, which our limits do not allow ; we have therefore confined ourselves to the researches of M. Breschet alone, and shall conclude this analysis of his work by his observations on the pathology of the skin.

“ *Pathology.*—We have said that beyond the derma, in the substance of the horny tissue, there is no network of blood vessels ; the proof is that in vesicles from blisters, which raise up all the horny tissue, there is found only an albuminous serum, produced by the rupture of the lymphatic vessels of the sudoriferous canals and of the excretory tubes of the mucus. We think that cantharides act on the secreting organs of the skin in a special manner, analogous to their action on the urinary passages, by exciting the circulation so as to occasion the rupture of the vessels, but they do not produce any effect on the epidermis ; they attract the blood to the erectile tissue of the derma, which frees itself of it by an abundant secretion. The redness of the skin in ordinary inflammation, is the result of the transparency of the horny tissue ; in fact it is never seen red unless when the epidermis is very thin ; inflammation never injects the thick layers of the sole of the foot, nor accidental callus unless by ecchymosis or extravasation of blood.

“ From the known structure of the skin, it is certain that the derma never remains stranger to any cutaneous disease, however light it may be, and that all the organs that compose it may be affected separately ; that is, that some one of them may predominate in the development of the symptoms. Thus the furfuraceous desquamations of the exanthemata and the different species of ichthyosis, may be looked on as having their seat principally in the secreting organs of the horny matter, for the epidermis detaches itself in scales upon scales, and occasionally in whole patches ; when a more or less considerable number of scales is agglutina-

ted by the drying of the matter. The affections of the horny matter, properly so called, should present different forms of squamæ, according to the different parts where they are seated, without the nature of those affections being changed; for the form and uses of certain regions of the body determine in the arrangement of the scales and the disposition of their outlines, what may be called local modifications; but which have no influence on the nature of the secreting organs or of the matter secreted. In the humid squamous tetter of Dr. Alibert, there is seen a more abundant secretion of the horny matter, which preserves its diffluent character, and occasionally becomes puriform. It is this matter, which, when condensed, constitutes the large squamæ belonging to a period of this disease, whose seat would seem to be in the glandular body, secreting the mucus which at a later period becomes the horny matter.

“ It would be necessary then, before examining a circumscribed cutaneous affection, to know perfectly the structure of the healthy skin in that part, in order to discover, if possible, among the detritus of the crusts the organ principally affected.

“ We have seen in our researches sudoriferous canals, whose exterior orifice was enlarged and corroded; we have seen the glandular organs, situated in the derma, hardened and scirrhou. The inhalant canals then ought to present symptoms peculiar to the lymphatic diseases. If we could localize diseases of the skin, and we think it possible, and with anatomy for our guide, point out the seat of each cutaneous affection, it would be a true progress for medicine and pathological anatomy.

“ In superficial sores the cicatrizing pellicle proceeds always from the circumference to the centre, and the granulations, commonly termed *fleshy*, are insensible to cautery. In seeing how the epidermis advances progressively upon the *hard part of the shell of a coronule* implanted in the skin of a whale, we can form an idea of the manner in which the cicatrix proceeds from the circumference to the centre of the wound, when it finds a support from the horny granulations that are organized with it. This cicatrix issues from all points of the most inferior layers of the neighbouring epidermis. To these layers are added others in succession, until the new pellicle has reached the level of the surrounding epidermis. The granulations called *fleshy* are insensible, because they belong to the epidermic mucous matter. In sores with loss of substance, when the derma is destroyed, there is found a cicatrix, at the sole expense of the surrounding horny tissue, that has been untouched. As soon as the cicatrizing pellicle can find a point of support on the vascular granules, that fill the bottom of the sore or even on a bony surface, it extends from one edge to the other by the same process as the epidermis covering the scales of the tortoise, or the shells of the mollusca; this form constitutes cicatrices of a bad character and easily torn.

“ *Albinism.*—White spots on the skin; the different shades of colour in baldness or in plumage; and the changes of tint of all those parts from the effect of molting, of disease, or of age, have much em-

barassed physiologists. How is it that hairs become white where there has been an ulcer? Why has a feather different colours throughout its extent? Why has the porcupine's quill alternate zones of white, black, or brown? Why is the fur of many of the carnivorous, ruminating, and other mammiferi of a different colour in different parts of the body, &c. &c.

"A knowledge of the secreting apparatus of the pigment, and of its situation, gives the reason for all these phenomena. The secretion may never have taken place causing a true arrest of development; hence is albinism. In the foetus, the colouring does not take place until near the termination of intra-uterine life. In the negro race, this secretion of the pigment does not occur until after birth, neither does the pigment of the choroid appear at birth, and the eyes of the foetus are then as red as those of an Albino. If the secretion is scanty, the eyes from being a rose colour become bluish, and the hair is fair; according as the secretion becomes more abundant, the eyes become more coloured, and the skin and hair take a deeper hue. Age, the passions, the state of gestation, or diseases, may diminish or suspend this secretion, or render it more abundant in certain parts.

"From an original disposition in certain parts the pigment may be of different shades. The secretion may be intermittent, thus offering an explanation for the zones on the porcupine's quill, and in ulcers the secreting organs may have been destroyed, and the hairs which spring from it may be white, because the hair issues from a layer much deeper seated than that which furnishes the pigment, and it is well known that the part next to the bulb is never coloured. The reproduction of the horny tissue occurs from within outwards. If you cut a feather from the wing of a bird, it shoots out, but always preserves its truncated extremity; if, on the contrary, a feather falls, a new one is developed, complete in all its parts; when crabs lose a portion of a claw, it is said that they tear away the remaining stump that an entire new claw may shoot out. It is thus that horns, nails, &c., are renewed.

"Unless we be in error, the anatomy of the cutaneous system has been demonstrated by us in an entirely new form. The derma, explored with a rigorous and persevering attention, has exhibited to us organs hitherto unperceived; we there have seen the course and termination of the nerves; the end or beginning of the blood vessels; the organs secreting sweat; the origin of the inhalant vessels; we have studied the nature and development of a body, at first mucous, becoming afterwards a horny matter; we have demonstrated the permeability of the epidermis, and given a new explanation of the natural colours of animals.

"To complete the work, it would be necessary to study the accessory parts of the skin, (as the crypts, &c.,) to examine the mucous membranes, and to inquire most minutely into a number of questions which at present are only sketched out; the subject is immense. The skin, considered as a *tout*, is not an organ, but a series of apparatus, because the organs it contains do not all tend to the accomplishment of the same function; and it is an extraordinary anatomical fact that so many different organs, foreign one to the other, should

be assembled in the same tissue. To resume then, this integument in vertebrated animals has presented to us—

“ 1. Parts essential and constant.

1. A first organ forming the mould and base of all the other parts.—The derma.
2. Organs of sensibility.—Nervous apparatus or the papillary bodies.
3. Organs of exhalation.—Sudoriferous or hydropherous canals.
4. Organs of inhalation.—Inhalant or absorbent vessels.
5. Organs producing the horny matter.—Muciparous apparatus.
6. Organs producing the colouring matter.

“ 2. Accessory parts.

1. Hairs.—The hair, wool, bristles, &c.
2. Horns, prickles, scales, feathers, nails, &c.
3. Mucous follicles.—Adipose and sebaceous follicles, &c.

“ *Conclusions.*—1st. There does exist an apparatus of exhalation, composed of hydropherous or sudoriferous canals, disposed in spirals, open at the surface of the skin by one of their extremities, and corresponding, by their other extremity, to the derma in a parenchymatous or glandular body.

“ 2nd. The inhalant canals are situated in the mucous body, constituting the epidermic layers. These absorbent canals seem to be unprovided with orifices at their extremities.

“ 3rd. The medium in which the absorbent canals are distributed above the external surface of the derma.

“ 4th. The mucous matter, which in hardening forms the different epidermic layers, is produced by a peculiar apparatus, composed of a principal organ, similar to a gland, corresponding to the deepest part of the derma, and of an excretory duct.

“ 5th. The epidermis or horny tissue, resulting from this secretion and from its mixture with the colouring matter, is traversed by the sudoriferous canals, the inhalant vessels, the nervous papillæ, &c. The two latter do not open outwardly.

“ 6th. A second apparatus, situated near the surface of the derma, is loaded with the secretion of the colouring matter or pigment. This apparatus is composed of glands and little excretory ducts.

“ 7th. The matter secreted by this apparatus combines with the diffluent horny matter or *corpus mucosum* of Malpighi, giving colour to it and its dependencies.

“ 8th. The epidermis resulting from the secretion of the mucous matter, and its combination with the pigment, is disposed in successive layers. From this disposition result the scales of the superficial layer or the *epidermis* of many authors.

“ 9th. The apparatus of sensibility is composed in the skin of papillæ or conoid eminences formed essentially by the nervous extremities, enveloped by the epidermic layers; and the nervous filaments, deprived of their neurilema, end by anastomosing with one another, forming arches.

“ 10th. These papillæ are penetrated each by a little blood vessel, much inferior in volume to the nervous filaments which are very apparent.

“ 11th. The nervous filaments, though they part with their neurilema to penetrate the epidermic sheaths, preserve a proper membrane.

“ 12th. The derma is a fibrous and vascular tissue, in which are contained the organs of secretion and the beginning of the excretory canals; the origin of the exhalant vessels and many of the lymphatics and blood vessels. The latter correspond principally to the two surfaces of the derma, particularly its internal one, and form there numerous net-works, or a sort of erectile tissue. The blood-vessels do not penetrate the mucous body or horny substance, and beyond the derma, it is only in the papillæ that blood-vessels are to be seen, and there they are in very small number, and difficult to be distinguished; but by the aid of injections and magnifying glasses lymphatic vessels are perceived at the external surface of the derma, in the first layers of the *corpus mucosum* and surrounding the papillæ disposed in a net-work, the meshes of which are more or less close, without a possibility of recognizing terminating orifices in them.”

J. C.

Notices concerning Works on the Practice of Physic, Surgery, Pathology, and Physiology, recently published in Germany.

(Continued from Vol. V. p. 269.)

WE recur with pleasure to the task of communicating some extracts from late German publications, and we only regret that our limits are too scanty to permit us doing justice to the subject, for the medical press of Germany was never so rich in valuable productions as at the present moment. Those who are anxious to obtain information concerning whatever has been published in Germany during the years 1832 and 1833, will find the greatest advantage in consulting *Die Leistungen und Fortschritte der Medizin in Deutschland im Jahre, 1832 and 1833*, von MATTHIAS JOSEPH BLUFF. This work, in two thick octavos, enumerates in the first instance all the periodicals of Germany, and refers to the subjects most worthy of notice, treated of during the above years in each; this alone renders these volumes precious. In the body of the work we find the title of every monograph and of every treatise and medical work published during the same period; but this is not a bare list of titles, it is a most complete catalogue raisonné the whole being arranged under different headings, so that it requires little trouble

to ascertain what works have appeared in each branch of medicine or surgery. But this is not all, for our author presents us with a short but extremely effective analysis of each separate work, together with observations on the peculiar opinions, merits, and discoveries of its writer ; so that we are thereby enabled to choose, without fear of disappointment, whatever best suits the objects of our studies. An undertaking such as that of Dr. Bluff is unparalleled, for utility and labour, in the annals of literature, and we hope it will meet the encouragement it deserves, for he intends publishing a volume every year, thus presenting his readers with an annual register of German medicine, surgery, anatomy, chemistry, and physiology. According to the plan he proposes, we may soon expect the volume for 1834. In the commencement of his last he makes some very sensible observations on the meetings of the German associations for the purposes of science, in imitation of which, those of France and Great Britain have been established. In France such an association was much less required than in England, for literature and science receive there great encouragement from government, and their votaries are looked up to with respect by the public. In England the aristocracy of wealth, of fashion, and of politics, engrossed every thing, and to insure respect in society, a man must be known either to be of a fashionable circle, the owner of a heavy purse, or a useful political partisan. The mere man of science, the cultivator of letters, though respected by a select few, was neglected by the government and the public at large. There can be no doubt that the establishment of the British Association has contributed much, very much, to raise the general estimation in which science is held, and by bringing together, under circumstances of eclat and notoriety, the professors of the various departments of literature and science from every part of the kingdom, it has forcibly excited public attention, has increased the reputed dignity and honour of intellectual pursuits, and has acted as a powerful stimulus to government, which has too long slept over the interests of science. These advantages have at once resulted from the meetings of the British Association, and no one will deny their importance. The first meeting of this nature held in Germany, was at Leipzig in 1822, after which they followed at Halle in 1823; Würzburg, 1824; Frankfort, 1825; Dresden, 1826; München, 1827; Berlin, 1828; Hidelberg, 1829; Hamburg, 1830; (no meeting in 1831 on account of cholera;) Vienna, 1832; Breslau, 1833.

This year the German Association meets at Bonn, in September. We have been induced to speak of this meeting at the present moment, as we are anxiously expecting that of the

British Association in Dublin, where we have no doubt that its members will be received in a manner creditable to the respect Irishmen have always evinced towards the votaries of science. Formerly but little existed here to attract scientific strangers, and Dublin was never visited by our neighbours, except they were forced by business. It was not that Ireland, for so long a period, was unproductive of genius; the country of Boyle, Berkeley, Swift, Burke, Goldsmith, Sheridan, and Kirwan, must always have commanded respect. These were stars of the first magnitude; but they were few and far between, and formed exceptions to, rather than examples of, the literary attainments of their countrymen, for it cannot be denied, that until of late, Ireland could scarcely be said to have started in the race of science. She has at length, however, girded up her loins for the contest; the era of her literary apathy is passed; the time is gone by when our alma mater, merited the name of the *silent sister*; Brinkley, Hamilton, Lloyd father and son, Lardner, Luby, and Robinson, occupying the very foremost rank among the cultivators of the mathematical and physical sciences, have rendered the reputation of Trinity College equal to that of any European Academy, and to these can her sons point in triumph, when asked to name her great literary champions. It is not for us to speak of the reputation enjoyed by Dublin, in every thing connected with anatomy, surgery, and medicine. But a few years ago, that reputation was still unborn; now it is vigorous and matured. If any proof were wanting, it may be found in the list of articles published in the Cyclopaedia of Practical Medicine.

It is acknowledged by all, that Irish contributors have furnished so great a portion of the valuable matter contained in this truly national work, that without their aid, the undertaking could scarcely have been accomplished by the respected editors. But a few years ago, no literary periodical existed in Ireland; some, it is true, had at various times been attempted, but they either fell still born from the press, or else struggling painfully through a brief existence, died, evident malformations, unregreted even by their disappointed parents. The only wonder was, that acephalous beings, without brains, and endowed with imperfect organs of *circulation*, should have so long survived. In the Père la Chaise of Irish reviews, magazines, and journals there are not a few sepulchres; but though we have stepped many a time, from tombstone to tombstone, intent on the epitaphs, still legible, yet none spoke of years; the mortal reckoning was easily told in months! One we except; its grave was fresh, the footsteps of its mourners

were still audible, slowly departing after the performance of their sad office. The inscription on the stone, NATUS A. D. 18—, OBIT 18—; was calculated to awaken, in the minds of the curious, admiration at so unexampled a degree of longevity. Is it then astonishing that we already begin to look upon ourselves as Mathusalehs? we who count our age in years not in months; we, whose offspring, seven thick and portly tomes, occupy so wide a space on medical book-shelves. But we have done, for it is suggested that garrulous egotism evinces not merely old age, but decrepitude.

Effects of Intoxication upon Graminivorous and Carnivorous Animals.

In the first part of the *Schweizerische Zeitschrift für Natur- und Heil-kunde*, published at Zurich in 1834, there is an exceedingly interesting paper, by the editor, Doctor Pomoner, upon the effects produced by spirituous liquors on animals. The experiments were conducted with the greatest care and perseverance, and the effects not merely of sudden but of long-continued, and repeated intoxication on dogs, rabbits, &c., were watched with indefatigable attention. Some idea of our author's industry may be formed from the recital of the third and fourth experiments, which lasted sixty-nine and seventy-four days respectively. In each a dog, three quarters of a year old and seven pounds weight, had brandy injected into his stomach; the quantity administered, twice a day, was at first only a drachm, but it was gradually increased to half an ounce, and as it appears that this dose did not produce any perceptible effect on the spaniels in question, we are justified in concluding, that they had become accustomed to the stimulus of ardent spirits, or to use the toper's phrase, that their heads were made. But, alas, it is a melancholy fact, that even the best made head (we speak not phrenologically) is subject to those weaknesses, those imperfections of our nature, which have rendered the words intoxication and intemperance necessary in all human vocabularies; and accordingly our two canine friends exhibited undoubted symptoms of commencing inebriety, when the dose of brandy amounted to five drachms. It is curious enough, that in such animals, the effects of an over dose of spirituous liquor is first evident in the lower extremities. Before the animal appears the least stupid or sleepy, and while the power of the fore-legs remains unimpaired, that of the hind legs is greatly diminished; and consequently while the anterior half of the body is firmly obeyed by its still sober members, the posterior

half is miserably tottering upon weakened and uncertain support. This fact is well worth noticing, and is the more interesting when we consider, that it is after all but an example of a general rule ; for most poisons which exert an influence upon the nervous system, such as opium, other narcotics, strychnine, woorara, and many deadly substances, act in the first instance on the lower, or speaking of quadrupeds, on the posterior extremities. This we have often observed ourselves, and it has been recorded by all experimenters, Orfila, Magendie, &c. Nothing, indeed, is more common than the remark, that " the animal moved about on the fore legs, dragging the paralysed hind legs along the ground." Hence we are enabled to comprehend the deep knowledge of physiology, evinced by those votaries of Bacchus, who assert and assert justly, that inability to walk is no proof that a person is intoxicated ! The head may be clear, and the hand and arm possess their wonted muscular strength, and yet the individual, when he trusts himself to his legs, may be scarcely able to cross the room. It is evident, therefore, that these considerations and these experiments prove, that there are more causes for the staggering of a drunken man, than are generally imagined ; he reels not merely because his head is giddy, but also because his disobedient and half powerless legs, are overloaded with their ordinary burden. Modern anatomists and physiologists take peculiar pleasure in pointing out every striking coincidence between their own conclusions and the immortal works of the ancient sculptors. Thus they bestow deserved encomiums on the accurate observation of nature, exhibited in the fighting gladiator and in the Laocoön, where the abdominal muscles, being thrown into general and violent action, the artist has not failed to extend that action to the cremasters, in consequence of which, in both these figures, the testicles have deserted the lower portion of the scrotum, and are spasmodically drawn upwards towards the ring ! Does an equally profound knowledge of physiology appear in the figures of drunken centaurs and Lapithæ ? Are the inebriated satyrs, so often introduced in festive processions, "as the *Bacchi prævia turba dei*," are these less than gods and more than men represented in a state of physiological intoxication ?* Be this as it may, and let the knowledge of the ancients on this important subject have been

* The definition of satyrs is thus quaintly, but seriously and tersely given by an old author—*Dei, capite cornuto, pedibus caprinis, toto corpore viloso, velocissimi.*

ever so accurate, it surely cannot surpass the depth of observation contained in the Irish saying, "that no man ought to be counted drunk, who though fallen to the ground, can still lay hold of near objects with his hands!" It is pleasing to find the experience of a nation tending to identically the same result with the philosophical experiments of a sober German. There is one conclusion, however, which Jordan has arrived at, and which our own observations do not confirm. He asserts that his experiments prove man to be the only animal, in whom drunkenness is preceded by a period of great bodily and mental activity, in fact by a period of exhilaration. From his testimony it appears, that dogs, cats, rabbits, hares, horses, cows, *et hoc genus omne*, whether graminivorous or carnivorous, may be made dead-drunk,* but not merry, with wine; in fact it appears, if our author has observed accurately, that man is the only animal whom wine enlivens, when taken in moderation. There is evidently a mistake here, for it is well known that horses, when greatly fatigued by violent exertion, are suddenly revived by porter or even spirits, and we ourselves can testify, that on one occasion, a quantity of spirits having been mixed with the food of several pigs, they exhibited the first or exhilarating stage, quite as evidently as we ever observed in the most rational biped. Nay, we have even extended our experiments to flies, and grasshoppers, and if we are not strangely deceived, these animals are affected, at least so far as their motive powers are concerned, precisely like man; first they become sportively restless, then a staggering stage succeeds, and lastly they lie motionless; and what is still more singular, they will again recover from a state apparently inanimate, after it has continued many hours! in fact they seem to sleep off the effects of the debauch! We say *seem*, for as yet no one has investigated with the attention it deserves, the subject of the sleep of insects. Much might be done by observing the effects of narcotics on these animals. The subject is one of great physiological importance.

It is curious enough that *Pommer* was not able in the animals he experimented on, to detect the odour of alcohol in the brain, any of the viscera, or in the blood. In ten persons

* In a Review of Andral's *Clinique Medicale*, lately published in that best of British medical periodicals, Johnson's *Medico-chirurgical Review*, it is oddly enough observed, that the French expression *ivres morts*, which the Reviewer translates *drunk-dead*, is not precisely the same as *dead-drunk*! This is a repetition of Sir Montague Matthew's distinction between a horse-chesnut and a cheanut-horse.

examined by Andral, and who died after enormous potations of brandy, he found neither in the ventricles or elsewhere, any odour of alcohol. Still we cannot subscribe to Dr. Pommer's conclusion, that the alcohol is never absorbed into the circulation, until it has undergone previous decomposition, for we, ourselves, have witnessed the dissection of a sweep, whose brain and its membranes exhaled a notable smell of spirits, and (as is cited by Andral,) Dr. Cooke, in his work on nervous diseases, has recorded a case where there was found in the ventricles a clear fluid which had the taste and smell of alcohol, and which took fire on being brought near a burning body.* The following observations of Dr. Pommer, are of great physiological and pathological importance, and accordingly we give them without abbreviation.

" Alcohol, injected into the blood-vessels, proves fatal in consequence of producing speedy and direct exhaustion of the cerebral and nervous energies, and occasions a destruction of the motion and sensitive functions, soon followed by a cessation of breathing. Animals poisoned by alcohol, exhibited indubitable symptoms of narcotism, and an apoplectic state of brain. The head was often rolled about convulsively, while the disordered motions of the whole muscular system, proved that the spinal marrow felt, in the first instance, the effects of the poison, and yet no marks of inflammation could be detected in either the brain, spinal marrow, or nervous plexuses. It deserves likewise special notice, that when *the injection of a moderate quantity of alcohol* into the veins proved fatal, no marks of disorganization could be detected in the blood itself, which seemed to retain all its physical properties unimpaired; neither was life in such cases extinguished by reason of a sudden retardation of the blood's motion, nor of the cessation of the heart's action, for this organ continued to beat, as long as under the circumstances could be expected. On opening such animals, the heart exhibited the natural proportions between the quantity of blood in its right and left chambers. The blood exhibited all its usual qualities of colour, fluidity, coagulation, &c. &c. Indeed, in some of the experiments, the last trace of sensibility in the heart did not cease until an hour after all marks of sensibility and motion had been destroyed in the general system of motion, and respiratory muscles. It follows, therefore, that of the muscular organs, in animals killed by alcohol, the heart dies last; we must therefore attribute their death, not to changes wrought directly in the blood, but on the nervous system, changes which are felt more suddenly, when the alcohol is injected into the blood, than

* We suspect some mistake here, for though spirits may have passed from the stomach to the brain, yet it is scarcely credible that it would have done so without becoming considerably diluted, in which case it would not take fire.

when it is applied to the stomach or any other part, merely because, in the former case, it is instantly conveyed through the medium of the circulation, so as to come into immediate contact, while unchanged, with the nervous extremities, and the nervous centers."

Our author, on the same grounds, thinks that the poison of serpents proves fatal in a similar manner, not by altering the blood physically, but by being conveyed through its medium, so as to come into contact with the nervous system generally. We must confess that many difficulties here present themselves, and after all it appears a dispute about words, for who can deny that the blood is physically different, when mixed with alcohol or viper's poison, from healthy blood. That it, to our feeble senses, appears to retain the same odour, colour, and consistency, is no proof of its not being altered; as well might we say that water holding tartar emetic in solution, is not physically different from common water, because we cannot distinguish them by the taste, sight, smell, or touch!

Our author concludes with a list of all the authors who have made experiments on the same subject; we subjoin them:— Major, 1664; Elsholz, 1665; Baglivi, Lanzone, Friend, Fontana, Siebold, Segalas.

Epidemic Hemeralopia, in the 19th Prussian Regiment of the Line.

Hemeralopia became epidemic in two battalions of this regiment, quartered at Ehrenbreitstein, and Pfaffendorf, in the months of July and August, 1834, and attacked, in all, 138 soldiers. When the disease first broke out, those affected were thought to be malingering, but a close examination of the symptoms, and the further spreading of the malady, proved the incorrectness of this suspicion. Those who suffered were unable to find their muskets if they for a moment laid them out of their hands at night, and they experienced so much difficulty in distinguishing even near objects in the dark, that when they were posted as sentinels, they feared to pace up and down near their sentry box, least they might not be able to find it again. When ordered to march or perform any military evolution during the night, they were constantly stumbling, and knocking against each other, in a manner that could only be accounted for by a defect of vision. In none did the general health appear in the least deranged, and in none could any morbid alteration be detected in the eye itself; the only thing complained of was a dimness of vision, as the twilight of evening came on, and which increased as the night advanced.—

This dimness they compared to that caused by a film spread over the eye. Surgeon General *Hübner* investigated this singular epidemic with great attention, and attributed its origin to the following causes:—1st. The great heat of the summer. 2nd. The fatigue experienced by the soldiers in the frequent ascent of the steep heights of Ehrenbreitstein and Pfaffendorf, a fatigue the more sensibly felt on account of their being all natives of Posen, a flat and level country. 3rd. The frequency of their exercises and parades, on an unshaded and dazzling sandy soil, where also they were exposed to the reflection of the sun's rays from the surface of the Rhine. 4th. The extreme darkness of their rooms, which rendered their eyes more sensible when they went out on duty, or for pleasure. It seems most likely, that the second and fourth causes were the most efficient, for two other companies of the same battalions, quartered in the neighbouring valley of Ehrenbreitstein, entirely escaped the disease. Their barrack-rooms were large and well lit, compared with small, dark apartments in the fortifications, where these companies were lodged. The treatment was very simple, and consisted in removing those affected to an hospital in other quarters, where they were no longer exposed to the operation of the exciting causes, and in the application generally and topically of cooling remedies, calculated to diminish congestion. To effect this, cold lotions, frequently applied, low diet, and rest, were alone sufficient. In the space of four weeks they had all recovered, and were enabled to resume their duty. There were no relapses, a fact easily accounted for, by the diminished intensity of the exciting causes during the month of September.—*Medizinische Zeitung*.

New Method of treating Croup.

The following observations from the pen of Dr. Lehman, staff-surgeon in Torgan, are well deserving of notice. According to my experience, says Dr. Lehman, there is no better way of treating croup at its commencement, than by the application of hot water to the larynx. This method has the advantages of being simple, efficacious, and easily applied, and its good effects are not productive of any injury to the constitution. The proper time for the application of this method, is at the very commencement of the disorder, when, as is usually the case, the child is awakened suddenly during the night by its invasion; no time should be lost, when we observe that the breathing is anxious, disturbed, and attended with the well known croupy sound, and a cough of a ringing character, &c.

The symptoms are too well known to require enumeration here ; suffice it to say that the most speedily fatal cases are those, where the child goes to bed, apparently quite well, and not labouring under any catarrhal symptoms, and is awakened from a deep sleep by the attack of croup. Such cases often prove fatal in twenty-four hours. Even when thus intense, the disease may be arrested in its progress, by the immediate application of hot water, in the following manner : a sponge, about the size of a large fist dipped in water, as hot as the hand can bear, must be gently squeezed half dry, and instantly applied beneath the little sufferer's chin, over the larynx, and windpipe ; when the sponge has thus been held for a few minutes in contact with the skin, its temperature begins to sink, and it requires to be dipped again in the hot water. It is better to have a second sponge ready, so that they may be applied alternately. A perseverance in this plan, during from ten to twenty minutes, produces a vivid redness of the skin over the whole front of the throat, just as if a strong sinapis had been applied. This redness must not be attended or followed by vesication ; in the mean time the whole system feels the influence of the topical treatment ; a warm perspiration breaks out, which must be encouraged by warm drinks, as whey, weak tea, &c., and a notable diminution takes place in the frequency and tone of the cough, while the hoarseness almost disappears, and the rough, ringing tone of voice subsides, along with the dyspncea and restlessness ; in short all danger is over, and the little patient again falls asleep, and awakens in the morning, without any appearance of having recently suffered from so dangerous an attack. If, on the contrary, a slight cough still remains next day, it may be easily gotten rid of by means of diaphoretic and antiphlogistic remedies suited to a feverish catarrh. When the suitable application of hot water, in the manner above recommended, does not produce well marked and evident relief, at furthest, at the end of twenty-five minutes, then nothing more can be expected from a longer perseverance in it, and the increasing cough, hoarseness, anxiety, and dyspncea of the child, must be met by other means. I must observe, however, continues Dr. Lehman, that this method has not yet failed in my hands, *when applied in the commencement of the disease*, and it has been practised in several families I attend, in many cases successfully, and before my assistance could be procured.*

* In addition to this remedy of hot water, which may be always had in a few minutes, I would advise the instant detraction of blood from one or both arms. If the hot water fails to give relief, then more blood, if necessary, may be

Method of applying Leeches to any particular Part of the Skin.

In a conversation between the Professor and his pupils, in the surgical clinic of the Charité at Berlin, it was one day incidentally mentioned, that we possess no certain method of making leeches bite exactly where we wish, for in applying them with the finger, they generally swerve a little to one side, and when they are enclosed in tubes of glass or quills, their inclination to bite is frequently checked by this confined position; Dr. Ernst Elben, who happened to be present, immediately observed, "an experiment has just occurred to me, by means of which I can accomplish it." The Professor consequently marked out a certain number of points on the skin of a patient; Dr. E. now took a piece of grey blotting paper, such as is used for straining coffee, and made in it a number of little holes, corresponding to the indicated points; he then dipped the paper in water, and laid it on the skin of the patient, in such a way that one of the little holes he had made in it with a scissors, should be exactly over one of the indicated points. He then placed the leeches on the surface of the paper, which he prevented them from leaving; the animals finding themselves in contact with a rough surface, to which they could not make themselves fast by means of the head, began to creep about, and continued their motions until they came to an opening in the paper; the moment each leech found such an opening, it instantly applied itself to bite the exposed point of skin; thus the object was effected. While the leeches were engaged in sucking, a little more water, cautiously applied to the blotting paper, rendered its removal easy.—*Medizinische Zeitung.*

Osseo-cartilaginous Tumour in the Larynx.

In the Berlin Medical Newspaper, 17th September, 1834, Dr. Froriep has given the particulars of a very interesting case. Augustus Wimmel, a peasant thirty-eight years old, was admitted into the Charité, in the beginning of April, 1834. He had long laboured under a cough, with copious expectoration,

taken from the jugular veins, and the child should get a small dose of tartar emetic, every ten minutes, so as to keep it in a constant state of nausea, just within the limits of vomiting. This state, however, can seldom be attained, until vomiting has taken place once or twice. None but a medical man of experience is competent to superintend the administration of tartar emetic, in a case of croup; it should never be intrusted to nurses or parents. The medical man, or his assistant, should not quit the patient until he is out of danger.—R. J. G.

debility, and emaciation, and was moribund when brought to hospital. The history of his disease, induced the belief that it was phthisis pulmonalis, but on opening the chest no trace of tubercles was found. The substance of the lungs was healthy ; the bronchial tubes, extensively affected with redness and thickening of the mucous membrane, contained a great quantity of greenish, yellow mucus. The mucous membrane of the trachea also exhibited evident marks of chronic inflammation, being red and thickened, as far as within an inch of the cricoid cartilage ; here all marks of inflammation ceased. The larynx was now cut out, along with the upper portions of the trachea and oesophagus. A considerable tumour was observable on the left side of the upper portion of the excised mass, but the mucous membrane, corresponding to it, was not in any way altered or unnatural. This tumour pressed in such a manner upon the opening of the glottis, that it was impossible to see downwards, through the latter. It was about the size of a walnut, and projected inwards as well as outwards and backwards, into the lower portion of the pharynx. The greater portion occupied the left side of the larynx internally, within which it formed a considerable, projecting, irregularly shaped mass. The substance of the larynx was very much degenerated in structure, both in the part from which the tumour arose, and in its immediate neighbourhood ; it was of a firm osseous-cartilaginous texture, nearly homogeneous. A transverse section exhibited its connexion with the ligamenta thyreo-arytenoidea of the right side, and which it so pressed on, as nearly to obliterate the natural opening for the admission of air.

In a practical point of view, this case is instructive. First, it shews that an impediment to the free entrance of air into the lungs may, if it be of a very slow growth, proceed to an extent that would prove immediately fatal, were the obstruction suddenly formed. Secondly, it affords an instructive example, to prove that an obstruction to the entrance of air into the larynx, tends to produce inflammation, not of the mucous membrane of the larynx itself, but of the bronchial tubes ! The bronchitis, in this case, was evidently owing to the operation of the same causes that give rise to a similar affection, in cases where an animal breathes, for a long time, a vitiated atmosphere, imperfectly adapted to the support of life, for the presence of the tumour rendered the residual air necessarily less pure than natural, by impeding the entrance of the fresh, and the exit of the inspired air.

Spontaneous Amputation of the Foot.

A soldier, in the eleventh regiment of Prussian Hussars, fell, when in full gallop, into a deep ditch, along with his horse. He was extricated with great difficulty, when it was found that he could not stand on the left leg, the foot of which was much swollen, very red, and entirely deprived of all sensation. The inflammation of the foot and ankle, in spite of the most active antiphlogistic treatment, became exceedingly intense and phlegmaceous. In the course of a few days, a circumscribing line of suppuration was formed beneath the ankle, insulating the foot from the remainder of the extremity; beneath this line, and as far as the tops of the toes, the foot was of an icy coldness, and entirely destitute of feeling; its colour at first became paler and then livid, and this change was attended with vesication of the epidermis, from beneath which issued a serous fluid betokening gangrene. The existence of diffuse inflammation above the ankle, and the formation of puriform depots in the subcutaneous cellular membrane, prevented the performance of amputation by the knife. In the mean time nature worked with such diligence, that at the end of fourteen days, it was only necessary to divide a few sinews of dead muscles and some ligaments, to effect the complete amputation of the foot, which came away, without the loss of a single drop of blood. The separation took place in a line, corresponding to the articulations of the first series of bones, so that the astragalus, calcaneus, and os naviculare remained, while all the remaining tarsal bones came away. The latter were found to have been fractured and broken into many pieces, by the injury which had, in all probability, also effected a rupture of their connecting ligaments. The stump healed favourably.

Structure of Pseudo-membranes.

In a former number of this Journal, we noticed a very remarkable dissertation by Leowolf, entitled *Tractatus Anatomico-pathologicus sistens duas Observationes rarissimas de Formatione, Fibrarum Muscularium in Pericardio atque in Pleura obviarum*—c. tab. lithog. 4. Heidelbergæ, et Lipsiæ, 1832. In a late number of *Müller's Archiv*, this monograph has been noticed in a paper written by professor Wutzer of Bonn, who has for many years bestowed much attention on the structure of pseudo-membranes, and similar formations. He argues

strongly against the hypothesis of Leo Wolf, that the fibres observed occasionally in these morbid productions have ever a close resemblance to muscular fibres, either in composition, in colour, or in function. He thinks that they are much more analogous to fibrous coats of arteries. He confesses, nevertheless, that Doctor Leo Wolf has opened an extremely interesting field of inquiry, demanding more extensive observations and a more accurate investigation of the whole of this curious subject. For our own part, we do not feel inclined to deny the possibility of the formation of any tissue of the body, as a consequence of morbid action. The more simple tissues will be the most frequently produced; but may it not happen occasionally, that tissues, of even the highest order of vitality, are formed?

Many curious facts crowd upon our memory with regard to this subject, and many observations we have made tend to impress upon us the conviction, that there exists an inherent force in the vital powers of parts formed by inflammation or other morbid processes, which mould their forms into the various shapes circumstances require, and modify their physiological relations and even their chemical constitutions, in the most remarkable manner. Thus we lately pointed out to the class of the Meath hospital, that when polypi are slowly formed in the heart, before death, they present in their different parts very curious modifications of composition and structure. Thus it is by no means uncommon, for the body of the polypus to consist exclusively of whitish fibrin, coagulated in either a solid form or extended into a membranous expansion, but in both cases opaque and dense in its structure; now this portion of the polypi evidently consists of fibrin, possessing its usual qualities, both chemical and physical, whereas we may often observe other parts of the polypus, that are of a much more delicate structure, being fine, membranous, and transparent, and evidently identical with serous membranes. These serous portions usually occur in the shape of bands, extending from the main body of the polypus, and inserted so as to form loops around the *columnæ carneæ* or *chordæ tendineæ*, thereby forming a number of attachments, which prevent the polypus from flapping back and forwards, loose within the cavity of the heart. Here we recognize a struggle, even in the last moments of life, between the destroying and the repairing principles, between the morbid process, which causes the coagulation of the fibrin, and the *nitus formativus*, which immediately sets to work for the purpose of so fixing the coagulum, that it shall interfere as little as possible with the current of the blood, and

which it accomplishes by means of the serous bands already referred to, so different from the remaining portions of the polypus, and so admirably adapted for this purpose. Much stress is laid by chemical physiologists, on the difference between the animal basis of different membranes and structures, which in some cases resemble gelatine, in others fibrin, and in others, again, albumen. That the physical properties of such parts depend, ultimately, more on the arrangement of their particles, during the act of vital deposition, than on a real difference as to their chemical elements, seems proved by the fact before us, for here the transparent bands had all the physical properties of serous membranes, while the remainder of the coagulum possessed those of coagulated fibrin ; and yet these are believed to be chemically different, for albumen is considered to be the basis of the former. Was the coagulated albumen of the serous bands a mere modification of the fibrin, or was it derived from the serous portion of the blood ? No matter which hypothesis is adopted, the union between those portions of the polypus and the fitness of the serous bands to fulfil their temporary functions, is not the less wonderful.

Preservation of Leeches.

A. Voget, in a notice inserted in the *Pharmaceutische Zeitung*, observes, that he has been in the habit of adding a small quantity of powdered crabs'-eyes, to the water in which he keeps leeches. This powder of course sinks, forming in the bottom of the vessel a thin stratum, in which the leeches seem to take the greatest pleasure, creeping about on it, and thus cleansing the surface of their skins, and getting rid of the mucous threads and flocculi, with which they so soon become encumbered, when in a state of captivity.

Cavaillon, Chevallier, and Moreau de Jones, have all borne witness to the good effect of mixing charcoal with the water in which leeches are transported from one distant place to another. In cases where it is necessary to carry them during a long sea voyage, the inside of the vessel should be well charred, and some very finely powdered charcoal should be added to the water. Cavaillon prefers for this purpose *animal charcoal*, as it possesses much stronger antiseptic powers than the vegetable. It was by means of charring the casks and adding some charcoal to the water, that the French succeeded in conveying, in health and vigour, a considerable number of the fish called gorana, from the isle of Bourbon to Martinique.

Doctor Kluge, of the Charité, in Berlin, made some interest-

ing experiments, on the best means of preserving leeches.—From his researches, Dr. Heyfelder has been led to recommend a mixture of three parts of rectified spirits, four parts wine vinegar, and twenty-four parts water. The leeches are to be placed in this mixture, and are to be left in it a little less than five minutes, after which they are to be washed with fresh river water, and to be put into a vessel for keeping. Leeches that have been used are likewise served by this procedure.

Dr. Samuel Gottlieb von Vogel has published a short work, consisting of 180 pages, small octavo, which is extremely interesting and instructive, and is entitled *Medical Observations and remarkable Facts*, selected from his experience. This author is well known to the medical world, by his great work on the Practice of Physic and Pathology, and is probably one of the best practitioners in Europe. The unpretending volume, above referred to, contains much valuable and interesting matter, and may be ranked with the best productions of a similar nature ; such as those of Tulpus, Heberden, Home, &c. As it is not likely to come into the hands of our readers, we annex a few passages translated from the German, observing that our author has, in many instances, anticipated the improvements of recent writers. Thus he relates several cases of peritonitis, treated so far back as 1814 by leeching, and large doses of calomel and opium, pushed to the production of sudden salivation ; a fact proving that the antiphlogistic effects of mercury, properly managed, have been long known in Germany. It is true, a knowledge of this important fact was not general, but still it influenced the practice of a few ; whereas in France, as may be inferred from the late declaration of Lisfranc, (when speaking of Dr. Oberne's excellent method of treating acute scrofulous inflammation of the joints), that the anti-inflammatory effects of calomel in large doses were never credited.—Vogel's treatment too of croup, appears to have been eminently judicious, and scarcely admits of improvement. We shall briefly enumerate the heads of some of the different cases he relates.

1st. A puriform discharge from the left nostril, preceded for weeks by remitting hemicrania of the left side of the head and face, and followed by intense, continual pain, with a discharge of excessively fetid fluid from that nostril, together with small portions of concreted, stinking, animal matter. This fatal malady evidently originated in the antrum and malar sinus.—The patient's sufferings are described with a truly graphic pen.

2nd. A case of suicide in a lady, induced by the habit of masturbation, and we might add, by reading *Tissot*. The perusal of this case is calculated to excite the most melancholy feelings, as the expressions of the unfortunate monomaniac are recorded.

3rd. A case of hemeralopia, with a singular desire, on the part of the patient, to see light, or as our author terms it, a remarkable *light-hunger*. This desire was manifested while the child was still at the breast, when its nurse observed, that even while sucking, it would let go the nipple every ten or twelve seconds, for the purpose of turning the head round to the light; on every occasion it instantly had the eyes fixed upon the most luminous object within its view, e. g. the window, fire, candle, &c. ; and no matter what position she was placed in, the little child immediately exerted herself indefatigably to attain her favourite object. As the child grew older, this habit became more confirmed, and was so urgent, that she could not be induced by the sight of any object, however pleasing to children in general it might be, to turn from the light. Light in quantity seemed more attractive than any particular colour, it was brightness that fixed her attention ; and when in the worst humour, she could be immediately pacified by lighting a candle in her room at night, or by bringing her to the window in the day. As she grew older, it was found that she could not distinguish objects, except they were strongly illuminated, and that darkness was so disagreeable to her eyes, that she was always obliged to close them in the dark. When running about in the nursery, she saw nothing that was not placed directly in the light of the window ; all other objects in the apartment were to her invisible. In the same way she was unable to see on the stairs, for although sufficiently lit, they received but little direct light ; consequently in going up and down stairs, she shut her eyes, to avoid the disagreeable sensation produced by insufficient light, and groped her way by means of her hands, like a blind person. Perseverance and diligence, on the part of her parents, served to enable her partly to overcome this singular habit, and to fix her attention on objects not absolutely bright ; still the old deep-rooted love for light remained, and her sight, however cultivated, was always weak and uncertain, when employed in viewing objects not directly illuminated.

In No. 4, Vogel relates a very curious and instructive case of fracture of one of the semilunar cartilages of the knee joint. This case happened forty-eight years before the publication of the present work, and is extremely interesting, on account of the antiquated expressions and orthography, observable in the

letters of consultation, written by one of the eminent men of that period, when few, even of the crowned heads of Germany, were able to write or spell their native language with any tolerable degree of correctness. Half a century has produced the greatest improvement in this respect, and the German, the most original, copious, masculine, and pliant of the modern tongues, has been cultivated with the care it deserves. It is, notwithstanding, much to be regretted, that the medical writers of Germany so often pollute their vocabulary with words of Latin and French derivations, and which are altogether unnecessary, as the same ideas might be quite as well expressed by words purely German. To give one example. In an excellent paper published in the Berlin Medicinische Zeitung, the following barbarisms occur in one paragraph at page 203: *lamentirte, participirte, appliciren, variirten, tingirte*, not to speak of *accessorischen, quantitative, &c. &c.* But of all the Germanized Latin words we have met with, none is worse than *interimistisch*!

We must pass by number 5, a reputed case of consumption cured, and numbers 6 and 7, cases of hæmatemesis, with the remark, that Vogel places, and has for thirty years placed, much confidence in ipecacuanha, in various sorts of hæmorrhage. In one gentleman, who was several times attacked in 1820 with vomiting of blood, and whom Vogel sent for consultation to Butini of Geneva, we find that iron in the form of *Klaproth's martial tincture*, was recommended in doses of fifteen drops, three times a day, for the purpose of removing an indurated and enlarged state of the spleen. It was recommended also, to have the hypochondria well rubbed every morning with a little castor oil, and the bowels were kept soluble with a mixture, consisting of five ounces of dandelion juice, six drachms of some pleasant syrup, and two drachms of epsom salts. Of this one-half was to be taken early in the morning in bed, and it was to be washed down with a cup of weak broth. The second half to be taken in a similar way, in two hours after. The dose of the salt was to be diminished, if the medicine produced more than three evacuations daily. This vegetable and saline laxative was repeated, at long intervals, for three weeks at a time; the iron was taken during the intervals, and as the patient was subject to hemorrhoidal irritation, this, when defective, was increased by a large soap pill, inserted *per anum*, and when excessive, was relieved by the application of a few leeches to the fundament. As the colour of the patient, and other symptoms, indicated a poor state of the blood, a nutritious, but not stimulating diet, with much gestation in the open air,

were recommended. In the above treatment there are several points worthy of imitation. With regard to large tumefactions of the spleen, in middle-aged or old persons, we have often observed, in conformity with the remark of Aretæus, that ulcers very apt to break out on the body, and especially on the legs, hence we are in the habit of recommending issues in the legs in such cases. The directions given by Aretæus, as to the propriety of venesection in hemorrhages in general, and the extent to which blood letting should be carried, are among the very best we know.

From number 10 it appears, that Vogel used arsenic for the cure of epilepsy, so long ago as in 1810. He was also acquainted with the secret of applying narcotic plasters to the head, in certain cases of headache, a method recommended by Dr. Graves, in the Dublin Medical Journal. It may be here remarked, that in the treatment of some cases of hemicrania, the exhibition of internal remedies is often powerfully aided by hot stupefaction of the affected side of the head, followed by rubbing the painful parts with a little laudanum.

In No. 15. Vogel relates the case of a lady, forty-eight years old, who was attacked with symptoms of apoplexy in the morning. The fit was slight, but it left behind it well marked paralysis of the tongue and one arm. The paralysis completely disappeared in twenty-four hours. Whatever be the cause of apoplexy, whether it be pressure, or whether it be a change in the relative properties between the quantity of venous and arterial blood, circulating in the brain, there can be no doubt that this cause may act either on the whole brain, or on half of it, or even on much smaller portions, determining by the extent of the central mass affected, the extent of impairment of muscular motion which follows. On the other hand, this cause, this derangement of the circulation, may, where there is no extravasation of blood, as suddenly cease as it had supervened, and may vary in duration, in some cases lasting only for a few hours, in others for weeks or even months. We have known incomplete paralysis of a leg only last for half an hour; it was accompanied by no constitutional symptom but that of general fatigue, and recurred frequently at intervals for two years, when a sudden and complete hemiplegia, *commencing in the same leg*, took place.

In No. 17, Vogel observes, that some cases of *abortion* are preceded by tremors of the limbs, urinary irritation, and a sudden call to stool. This had happened in the case of a lady about the third month of pregnancy, several times in succession. A dose of opium, taken when these symptoms commenced, prevented abortion.

No. 18 is a case of occasional vomiting of fat and oily matters. Late pathologists have remarked the fact, that fatty and even wax-like matters are not very rarely found in the alvine discharges. There are two ways of accounting for so very curious an occurrence. The fact may be a secretion from the mucous membrane of the stomach or bowels, or it may be derived from the food, the other component parts of which the digestive organs have had power to dissolve and absorb, but not being able thus to dispose of the fat, it consequently remains undigested, and is passed off with the other excrementitious matters. The latter explanation is that of Vogel ; the former that of more recent pathologists.

What struck us most, however, in the perusal of Vogel's collection, were cases 27 and 31, which prove that he had long ago, in a great measure, anticipated our most modern and best writers on dyspepsia, in certain forms of which he employed narcotics, among the rest laurel water and opium, with the greatest benefit. We regret that we are prevented by want of room, from making further extracts from this valuable little work.

R. J. GRAVES.

SCIENTIFIC INTELLIGENCE.

PROCEEDINGS OF THE MEDICAL SECTION OF THE BRITISH ASSOCIATION AT DUBLIN, IN AUGUST, 1835.

First day, Monday, August 10th.

President:—DR. PRICHARD.

*Vice-Presidents:—A. COLLES, M. D., and
PHILIP CRAMPTON, M. D., Surgeon-General.*

Secretaries:—ROBERT HARRISON, M. D., and J. HART, M. D.

COMMITTEE:

MR. ADAMS.
DR. M'DOWEL.
DR. O'BIRNE.
MR. CARMICHAEL.
DR. HOUSTON.
MR. WHITE.
DR. OSBORNE.
DR. LENDRICK.
DR. GRAVES.
DR. STOKES.
DR. COLLINS.

DR. ALISON.
DR. GRANVILLE.
SIR A. CRICHTON.
PROFESSOR JEFFRAY.
DR. TRAIL.
DR. WILLIAMS.
DR. BROUGHTON.
DR. GRAHAM.
PROFESSOR CLARKE.
DR. NEWBIGGING.

The business of this section commenced about twelve o'clock, when the chair was taken by Mr. COLLES, in the absence of Dr. PRICHARD.

Dr. ROBERT GRAVES read a paper on the internal use of chloride of sodium in fever. The treatment of fever, said Dr. Graves, is a subject of such acknowledged importance, that I shall offer no apology for introducing to the notice of the Medical Section of the British Association, a remedy calculated to produce much benefit in certain stages and forms of that disease. The remedy of which I speak is the chloride of sodium, a substance first recommended in fever in 1827, by Dr. Robert Reid of this city, but which was never adopted by the profession generally, or exhibited internally in any of our hospitals, or in private practice, when I commenced a series of chemical experiments on its efficacy, in 1832. Since that time I

have employed it in many hundred cases of fever, and, on the whole, with satisfactory results. Many persons also, who have used it in the manner recommended, have expressed themselves in high terms of its utility.

With regard to the time for its exhibition, and the species of fever in which it may be employed with advantage; I have never given it except when the first stage is speedily followed by debility, and most commonly at a later period, when a depraved state of the secretions, petechiae, or maculae on the skin, and the well known group of symptoms are present, to which was formerly given the name of putrid fever, but which is now more generally called typhus. In inflammatory fever, in simple, continued, or in nervous fever, I have never ordered this remedy; nor do I believe it to be of the least use in controlling the febrile excitement of ague or of hectic. Again, where fever is the consequence of some local inflammation, whether arising spontaneously or from an injury, the chloride of sodium is quite inapplicable.

Though the arguments proving that fever may exist independently of inflammation do not come within the scope of this paper, I may be permitted to point out, *en passant*, some of the analogies which attest the existence of diseases implicating all organs and tissues of the body in their progress, and consequently entitled to the appellation of general diseases. Scrofula, when intensely developed, spares no tissue. The skin, glands, bones, muscles, cellular membrane, and parenchymatous substance of organs are all liable to its ravages. What organ or tissue escapes the destructive influence of the syphilitic taint? What part enjoys immunity when the body is deeply infected with scurvy? What is true of chronic is also true of some acute diseases, as for instance fever, in which we find every organ and tissue labouring under the influence of the disease. But it is unnecessary for me to dwell on this point. Every accurate observer must be convinced that the effects of fever are disseminated through the whole system, recognisable in some parts by phenomena more or less distinct, in others exhibiting scarcely any thing appreciable by our senses, but in most cases, at certain periods, pervading every tissue of the body. It is equally true, that we are, and I fear shall ever remain, ignorant of the nature of this poison. We know just as much of the nature of the febrile miasm, or the virus of syphilis, as was known in the very infancy of medical science; the mode in which either acts still continues among the impenetrable *arcana* of nature. All we can do is to observe their effects, and from them to draw practical conclusions which may be rendered available to treatment; to study their phenomena with attention, and to employ such remedies as observation and experience have proved to be most applicable, without expecting to be able to explain their effects in the majority of instances. We know that it is not increased action of the heart and arteries which gives rise to fever; for we find some of the worst cases with slow pulse, and but slight elevation of the temperature of the skin. The same thing may be said of any

other symptom or organ. Fever is, in the strict sense of the word, a general disease, and there is, in the case of a fever patient, no one point on which the physician can lay his hand and say, here is the local habitation of the disease; if I can succeed in removing this, I am certain of success. Observe here, I speak of fever generally. When topical inflammation arises during the course of fever, and is accompanied by increased vascular action, by diminishing this, and removing local inflammation, you can effect a great deal of good; you extinguish a train of morbid phenomena which react injuriously on the system; you simplify the process of treatment; and by rendering the fever uncomplicated, you increase the chances of a favourable termination. I allude here only to that state of fever in which the disease may be termed simple, and where there are no local complications; for it is only in such cases that general remedial agents, such as the chloride of sodium, can be employed. From these observations it will be perceived, that I am no advocate of the doctrine that attributes all fevers to the existence of local inflammation, latent or evident; and indeed I do not think there is a single physician of experience in Dublin, who is not convinced of the groundless and untenable character of such an hypothesis. I am the more particular in dwelling on this point, as my friend Dr. Horn, in his account of the medical institutions of Great Britain, has misrepresented some of my colleagues, and described them as disciples of Broussais.

Dr. Graves next referred to the discovery of chlorine, by the late Sir H. Davy, its employment as a disinfecting agent, and the subsequent use of its combinations with soda and lime, in consequence of the disadvantages attendant on using it in its gaseous or uncombined state. He alluded to the experiments of Dr. Reid, who was the first to exhibit the chloride of lime internally, during the epidemic of 1826-7, in cases of fever and typhoid dysentery, but stated that he did not intend to go into the detail of these experiments, as they were already before the public in a paper published in the *Transactions of the King and Queen's College of Physicians*, for the year 1827. He stated that he was first induced to try the chloride of sodium internally on an extensive scale, by the perusal of a very interesting pamphlet, written by Dr. Lawrence, the present archbishop of Cashel, a celebrated oriental scholar and an excellent chemist, and published by Messrs. Hodges and Smith about three years ago. He would not take up the time of the meeting by reading the valuable information communicated in that pamphlet, but would strongly recommend it to the notice of the profession.

With respect (said Dr. G.) to the time for its exhibition, and the cases to which it is adapted, the following remarks may be made. When the early stage of fever is past, when all general and local indications have been fulfilled, when there is no complication with local disease, when the patient lies sunk and prostrated, when restlessness, low delirium, and more or less derangement of sensibility is present, when the body is covered with maculae, and when the secre-

tions from the skin and mucous membranes give evidence of a depraved state of the fluids, it is then that the chloride of sodium may be prescribed with the most decided advantage. The mode in which I prescribe it is in doses of from fifteen to twenty drops every fourth hour, in an ounce of water or camphor mixture. How it acts I will not pretend to explain ; it is sufficient to say, that there is no remedy from which, in such cases, such unequivocal benefit is derived. It operates energetically, though not very rapidly, in controlling many of those symptoms which create most alarm. It seems to counteract the tendency to tympanitis, to correct the foetor of the excretions, to prevent collapse, to promote a return to a healthy state of the functions of the skin, bowels, and kidneys ; in fact, it appears admirably calculated to meet most of the bad effects of low putrid fever. To those who have witnessed its efficacy, it is unnecessary for me to say any thing. Of course it will fail, like all other remedies, when the disease has reached a certain point of intensity in individual cases. There is scarcely any acute disease, to which the human body is liable, which may not in some particular persons assume an intensity capable of baffling all the effort of medical skill. This, however, is no argument against the employment of a remedy of extensive utility and unquestionable value.

Although it is not my intention to give an account of what has been done in France with respect to the exhibition of this remedy, yet I may mention, that it has been extensively tried in fever by Chomel, and as I have learned with great success. This excellent physician is still, I believe, engaged in making further clinical experiments on the subject. In the *Gazette Medicale de Paris*, published on the 28th of last February, we have an account by Doctor Dor, of Marseilles, of several cases of typhus, in which the chloride of sodium was found beneficial in 1833. He attributes a more rapid amendment to the use of this remedy than I have ever seen follow from its exhibition, and he also asserts, that if not given with great caution, it produces a very tedious convalescence. In the latter remark, especially, I cannot concur ; for all who witnessed this mode of treatment here, were struck with the security and quickness of recovery which ensued in those cases where it had been employed. Perhaps, the precaution we adopted of always diminishing, as soon as possible, the strength and frequency of the doses, rendered the results in our hands more satisfactory than those obtained by Dr. Dor.

Dr. Graves concluded his observations by reading a letter from his colleague Dr. William Stokes, in which the use of this remedy is stated to have been followed by the most satisfactory results. It gradually but steadily removed all the bad symptoms, and in all cases the patients had most favourable convalescences. Dr. Stokes remarks, that all these cases recovered without any evident crisis.

Mr. F. WHITE asked, what was the quantity usually given at a time, and whether the dose was gradually increased ?

Dr. GRAVES said, that the quantity given at a time was from

fifteen to twenty drops, and that the dose was never increased beyond this quantity, which was given every fourth hour. In all cases it had a fair trial, but was never continued longer than six or seven days.

In answer to a question from a member, Dr. Graves stated, that the solution which he used, was that which is sold at the Apothecaries' Hall, and which is generally considered to be a saturated solution.

Dr. ALISON inquired, whether wine and stimulants were used during the time of its exhibition?

Dr. GRAVES replied in the affirmative, wine, stimulants, and nutriment were given with it, according to the exigencies of the case.

The Secretary then announced, that Dr. Houston would read a paper on certain peculiarities in the circulating organs of diving animals.

Dr. STOKER here addressed the meeting, and requested to know whether his paper would be read or not. He also wished to correct a mistake in the announcement of that paper, namely, that its object was to identify cholera with typhus fever. He never entertained the idea that typhus became cholera; all he intended was to mark the transition from typhus to the epidemic of 1832.

On the Peculiarities of the Circulating Organs in Diving Animals. By J. HOUSTON, M. D., M. R. I. A., &c. &c.

It is a well established fact in physiology, that, notwithstanding the peculiar influence which the vital powers exert in carrying on the circulation of the fluids in animal bodies, the movement of those fluids is to a certain extent, amenable to the general laws of hydraulics; that although the circulation is first set in motion, and afterwards carried on, by the inscrutable principle of life, and is stopped for ever by the extinction of this principle, yet, nevertheless, under the influence of gravity, of atmospheric pressure, of motion, and of other powers which direct the movement of all dead matter, the fluids circulating in living bodies are much swayed in their courses.

We know, for example, that in a hanging posture of the limbs, the circulation through the veins of the pendent members becomes languid, independently of any other mechanical obstacle; that the blood, notwithstanding its locality in a vital part, and notwithstanding the several provisions for urging it to the centre of the body, stagnates and fills the vessels, sometimes even to bursting. Its own gravity here becomes a source of delay to its progress; and that in such case no other cause for its retardation exists, is shown by the result of subverting the position of the limb, when the fluid advances with its ordinary rapidity.

We are well assured also, from observation, that the removal of atmospheric pressure from a part of the surface of the body, as by the application of the air pump, causes the fluids to leave their wont-

ed channels, and flow in inordinate abundance towards the attempted vacuum.

We also know, for certain, that the opposite condition to the latter state, is equally productive of derangement to the circulation. That inordinate pressure on the surface repels the approach of fluids to the vessels, just as the abstraction of accustomed pressure causes them to rush thereto in unusual quantity.

The motion of the solid parts upon each other, giving rise to alteration in the exterior form of the body, or to its change of place, is a never failing source, by which the fluids entering into its composition are accelerated or retarded in their circuit. Hurried movements invariably cause them to flow with rapidity towards the centre, giving rise, as in the case of running, to unusual acceleration of the pulse; whilst complete cessation of motion in the body is followed by a subsidence of the action of the heart to its natural standard—that to which it recurs, when relieved from any mechanically operating cause.

There is still another power regulating the circulation of the blood, which exerts even a greater influence over its easy and natural progress, than either gravity or atmospheric pressure, when applied to the exterior surface of the body, or than the rapid movement of its muscles; it is, the action of the chest and air in the function of respiration.

It is a fact which I have myself determined by experiment, that if the trachea of a rabbit be tied so as to exclude fresh air from the lungs, the left auricle and ventricle, which receive the blood in its transit from these organs, become almost immediately emptied, and are not again filled so long as the obstruction to the respiration continues; whereas, during the same period, the right cavities of the heart, or those leading to the lungs, are loaded to excess with venous blood; and remain so until the death of the animal, or until the freedom of respiration is re-established. It may be concluded, from this experiment, that interruption to the process of taking air into the chest, in warm-blooded animals, is followed by a stagnation in the circulating fluids as a necessary and invariable consequence.

To these laws all animals, but in an especial degree those which breathe air and have warm blood dependent thereon, must be amenable. The question respecting the influence of such causes on the state of the circulation in fish, whose mode of respiration is of a totally different character, involves considerations, which, as they do not bear on the question before us, cannot now be taken into account. But, how great must be the difference in the operation of these causes, on the circulating system of warm-blooded animals inhabiting the atmosphere surrounding our globe, as compared with those of the same order whose natural habitation is the water!!

The terrestrial animal is continually immersed in its own natural element; the atmosphere in which it lives exerts a uniform and equal pressure on its body; and its lungs are always supplied, without fail and without interruption, by an appropriate *paratum vire*. At the highest distances from the surface of the earth, to which it is usual

for an animal to ascend, it experiences little or no inconvenience from any alteration in the degree of pressure to which its body is exposed, and it finds no change in the quality of the air which enters and vivifies its lungs. It is true, indeed, that animal bodies will be inconvenienced, on account of the abstraction of a portion of the weight of the atmosphere, which occurs when a very high elevation is attained: but under the ordinary circumstances of life, little or no variation of this kind is ever experienced. The atmosphere, which, in a perpendicular column of fifty miles in height, presses with a weight of about fifteen pounds on every square inch at the level of the sea, becomes lighter in the direction upwards, in such proportion, that at the height of a mile, the diminution is equal to about one-fifth of the whole, or three pounds; and notwithstanding such alteration in properties at that height, it was found by Gay Lussac, who made an aeronautic excursion to an elevation of four miles, that no embarrassment, sufficient to derange the functions of his body, occurred in any part of his journey. His respiration became, indeed, somewhat difficult and hurried, his pulse beat faster than natural, and he experienced considerable thirst. It appears also, from the experience of others who have ascended high mountains, that the derangements which do occur are of a character dependent upon a determination of blood from the interior towards the surfaces of the body; such as giddiness, bleeding from the nose, eyes, ears, and lungs; seldom, however, do terrestrial beings so far shift their natural quarters, as to be exposed to such amount of rarification in the atmosphere.

The only other known cause influencing the weight or pressure of our atmosphere, being that arising from the degree of moisture with which it happens to be impregnated, we may, on the whole, safely take it as an established fact, that in all habitable places, terrestrial animals experience no impediment to the free circulation of their fluids from the element which surrounds them, and require no particular modification of blood vessels to accommodate them for any changeableness in this respect.

Thus, even without reference to the experiments of philosophers, we have all observed how the lark, in soaring to such a height that it disappears from the eye, melting as it were into air, finds the surrounding element so alike to that which it breathes on the green-fields, that its notes are uttered in the distance with the utmost ease and sweetness. The same provision of circulating organs is competent to promote the healthy motion of its fluids in the one as in the other situation.

Very different, indeed, are the characters of the medium in which the warm-blooded inhabitant of the ocean lives and moves. Let us, for example, look at the whale, view him in the different regions of his wide domain, and consider the circumstances by which he is surrounded. The singularity of the predicament in which he is placed, in comparison with that of a terrestrial being, will lead us in search of some peculiarity in the state of his circulat-

ing organs, enabling him to live unhurt, under the action of forces, which would be destructive to the life of other animals, not formed for residence in such an element. When floating on the surface of the waves, and spouting up water from his blow-hole, the predicament in which he is placed differs little from that of an inland animal; he is in fact living in the atmosphere and breathing it through his nostrils;—but follow him into the deep and observe the extraordinary predicament in which he is there placed.

In the first place, his respiration is suspended, and that equally, when submersed for a short distance, or when plunged hundreds of yards below the surface of the sea. It is a well ascertained fact, that the whale can continue under water without interruption for upwards of twenty minutes: many writers even assert that he can dive for a much longer space of time. During all this period his breath is stopped, and his lungs cease to arterialize, or even to transmit the blood through the pulmonary veins into the left cavities of the heart. The predicament in which he is placed is exactly that of the rabbit alluded to in the experiment in which the trachea was tied, *viz.* he could not breathe. But in respect of the obstruction to the circulation arising from this cause the effect is equally great whether the animal be covered with a thin stratum of water, or plunged to a great depth in the ocean.

Another cause of embarrassment to the progress of fluids through the vessels at the surface of his body, and that, such as is never experienced by an animal whose habitation is on land, arises out of the enormous pressure to which he is exposed when deeply submersed in the water. A whale has been known, when struck with a harpoon, to descend perpendicularly, in five or six minutes, to the depth of an English mile, as shown by the length of the rope dragged after it, out of the whaler's vessel. Instances are even on record, where whales, under such circumstances, have broken their jaw-bones, and sometimes crown-bone, by the blow struck against the bottom at a depth of 7 or 800 fathoms. At such depths as this the pressure is enormous; and it is an interesting fact, that the first hint leading to a discovery of this principle in the ocean, arose out of a singular incident in whale fishing, which occurred in the observation of the elder Scoresby; and which, as it illustrates the subject under consideration, I shall here beg leave to introduce. A whale, struck with a harpoon, dived rapidly out of sight, and when the rope of the harpoon was all drawn out, the boat, to which it was fastened, was dragged under water,—the crew meanwhile having escaped to a piece of ice. When the whale returned to the surface “to blow,” it was killed, but immediately began to sink, which being an unusual occurrence excited some surprise. Scoresby, who was looking on, threw the noose of a rope round the tail of the animal, which nevertheless continued sinking, until stopped by the last mentioned rope, which, when all expended, was near pulling the second boat under water. Another rope was now let down, furnished at the extremity with a grapnel which fortunately hooked the rope belonging to the harpoon. The harpoon now lost its

held in the whale, which thereupon rose rapidly to the surface, leaving the sunken boat in connexion with the hook and ropes: Scoresby at first thought that the boat was entangled among rocks at the bottom of the sea, but he soon found that, by the assistance of about twenty men, it admitted of being raised, without, however, any lessening in weight as it neared the surface of the water. When fully dragged up, it required a boat at each end to keep it from sinking again, and was, with much difficulty, got into the ship. It appeared as completely soaked in every pore as if it had lain at the bottom of the sea since the flood; and a fragment of it, when thrown into the water, sank to the bottom like a stone.

From this incident, as important as it is curious in demonstrating the force of pressure by which the wood in a few minutes became so impregnated with water as to acquire a weight like that of a stone, a long train of very interesting experiments to ascertain the exact ratio of the weight of the sea, at different distances from the surface, were instituted by Scoresby, and afterwards by Perkins, from which it appears, among other things, that the weight increases with the depth, and that at a perpendicular depth of 2,110 yards, the pressure on a cube of wood two inches in diameter exceeds that produced by a weight of twenty tons.

The consideration of this fact, as applied to the question of pressure on the body of a whale, at the same depth, strikes us with astonishment; for, if a square surface of sixteen inches sustains, under such circumstances, a weight of twenty tons, what must be the degree of pressure exerted on the body of an animal sixty or seventy feet long, by thirty or forty in circumference.

Cetaceous animals are, no doubt, furnished with various provisions calculated to protect their bodies from the influence of such powerful agency; such are the great thickness and elasticity of their integuments, together with the subjacent stratum of fat; the rounded, smooth, and tapering form of their bodies; the smallness and prodigious thickness of the exterior tunics of their eyes; the absence of a nose, except as peculiarly modified for the purposes of respiration; the extremely diminutive size of the passage leading to their ears, &c. &c.; but notwithstanding all these peculiarities, tending to the same general object, it is impossible to conceive, but that an universal pressure of the amount which they are exposed to, must exert an influence sufficient to affect, through all these obstacles, the deeper departments of their bodies. There is nothing in the conformation of a whale to justify us in the opinion, that a degree of pressure under water, sufficient to soak in an instant every pore in the planks of a large boat, would cause no embarrassment to the functions of the animal which dragged it to such a depth. And, moreover, if the trifling diminution of pressure, experienced by those who, in balloons or by climbing mountains, have ascended high in the atmosphere, produces perceptible impressions on the body, it is right to conclude that the enormous increase of pressure experienced by animals, no matter how formed, at a great depth in the ocean, will be, to a greater

or less extent, productive of an opposite result; that, in fact, while in the one case the blood flows in unusual abundance towards the surface of the body, it will in the other be repelled therefrom and driven into its deeper recesses.

There are, then, two circumstances connected with the mode of life of aquatic mammalia, to which we find nothing analogous operating to the prejudice of the circulatory functions of those living altogether in atmospheric air, viz. long continued and complete obstruction to respiration; and a weight, frequently enormous, pressing on the surface of their bodies; and, in addition, the rapid movements of aquatic animals, whilst thus breathless and squeezed on all sides, often contribute to urge forwards the blood from the arteries into the veins, and to lodge it in, or near the right cavities of the heart.

The inhabitant of terra firma breathes in an atmosphere which is always abundant and wholesome. He is never weighed down at any one period with a greater incubus than at another; and when he moves with more than usual speed, there is little obstacle given to the free passage of blood through his lungs. The sovereign of the ocean, on the contrary, can only breathe when his head is elevated from his habitation; and his gambols in the deep subject him not only to the inconvenience of an enormous load upon his body, but also tend to stifle his breath, and obstruct the free circulation of his blood. What then, it will naturally be asked, is there in the condition of the circulating organs in this class of beings, enabling them to exist under circumstances, which bring inevitable and sudden death to others whose functions are carried on so much in the same way, and with the same kind of organization, but whose place of abode is different. The answer to this question is the object of the present communication.

In the foregoing prefatory remarks, I have taken the whale from among the aquatic mammalia, as an object of comparison with those residing on land; not so much because the anatomy of the animal is that with which I am best acquainted, but because his habits have been more an object of public attention, than those of other beings ranking in the same class. I have never, indeed, had an opportunity of examining into the state of the vascular system in the whale; but with that in the porpoise, seal, otter, and some diving birds, all of which lead a somewhat similar sort of existence, and possess a similar modification of blood-vessels in accommodation thereto, I am perfectly familiar, and can not only speak of them from observation, but can demonstrate their anatomy, from preparations which I have placed on the table.

I shall not occupy the time of the Association, by reading a detailed account of the state of the vascular system in any of these animals, but shall, in a general way, direct attention to the peculiarities on which it may be considered the power of remaining so long under water, and bearing up against the force of its pressure, depends. I shall take another occasion of entering more fully into the subject.

And, first, as to the porpoise, (*delph. phocæta*.) This animal in its organization resembles, most of any, the whale, of which, indeed, it may be considered a miniature. Its heart is very powerful, and the right ventricle bears a much greater proportional capacity and thickness, than that in land animals, a provision obviously connected with the greater resistance which the lungs occasionally offer to the passage of the blood. The *venæ cavae* are also very capacious, and all the great veins leading to them are either remarkably numerous, large, and tortuous, or formed into reservoirs, capable of holding nearly all the blood of the body. When the abdomen of a porpoise is opened, the whole inner surface of the parietes, but particularly that along the back and sides, presents a livid hue—an appearance arising from the extraordinary congeries of veins, under the peritoneum, distended with dark coloured blood. When the canal in the vertebrae is exposed, all the space not occupied by spinal marrow or nerves will be found filled with large veins of remarkable transparency, devoid of valves, and arranged more like the sinuses of the dura mater, than like ordinary vessels. The branches and trunk of the *vena azygos* are also much bigger than usual. The *venæ hepaticæ* are of great width, and with the other veins alluded to are capable of holding, without bursting, all that excess of blood which the asphyxiated condition of the lungs prevents getting forward. In addition, we find, that in this animal even the arteries in some places participate in the tendency to dilatability and tortuosity, so remarkable in veins. The intercostals, and other small arteries along the back and neck, take on, as shown in this beautiful preparation, a striking and unique plexiform arrangement, a fact first noticed by Tyson and Hunter. I have examined with care the blood-vessels inside the cranium, and have not observed that either the sinuses or veins, connected with the brain, differ from those of terrestrial animals—a circumstance which deserves to be noticed, as it would seem to indicate, on the part of the Creator, a watchfulness in protecting the centre or source of life in the animal, from the injury which must accrue to it, were the blood to accumulate about the organ in inordinate quantity.

I regret not having had an opportunity of examining the condition of these parts in the larger animals of this class; but from the partial and scattered accounts given by anatomical writers regarding the size and number of the veins in different parts of the body, I have no doubt that in them, exactly the same provision will be found to accomplish the same wise purposes, and on a scale proportionate to the increasing magnitude of their bodies.

I am prepared to exhibit also to the Association some preparations and drawings, showing the provision of which I speak, in the seal (*phoca vitulina*). In making these preparations I was much taken by surprise at the quantity of injection required to fill the veins of the hinder part of the body: syringe full after syringe full flowed in without meeting with that resistance which is always experienced when an injection is completed; and my apprehension lest extravasation might have taken place, operated against the complete suc-

cess of the preparation, as I desisted from urging the wax onwards before the vessels had received enough to give them sufficient fulness and rotundity. The preparations were the first of the kind I had attempted, and from my late experience in the matter, I would advise any gentleman who may undertake similar ones, to tie the vena cava inferior, near to the heart, and inject the veins of the fore and hinder parts of the body separately; otherwise, from the quantity of injective requisite, it will spread abroad through the veins, and becoming cold, thereby obstruct the farther entrance of the fluid.

It will be seen by these preparations, that, in the seal, the dilated condition of the veins is even more remarkable than in the porpoise. Those in the spinal canal are of extraordinary dimensions: the posterior and lateral parts of the neck, and also the back, are covered with a network of veins, which, when injected, cover over and hide from the view every other texture. An arrangement such as this is not found in any terrestrial animal; and, as far as I know, has never been described by any author. The liver is, as it might be expressed, scooped out into one vast reservoir; the hepatic veins forming bags rather than vessels, capable in themselves of holding nearly all the blood of the body. In this preparation, the contrast between the vena porta and hepatic artery, which are not one-third the size of the same vessels in the human body, and the enormous hepatic veins, whose diameter is greater than that of the right auricle of the heart in man, is singularly striking. The veins in the abdomen covering the lumbar muscles, and those on the surfaces of the kidneys are so capacious, that when filled with injection the parts beneath them cease to be visible.

In the otter (*Lutra vulgaris*), whose habits of life much resemble those of the seal, it is interesting to observe the near approximation to the same necessary condition of circulating organs. I have laid on the table a preparation made from one of these animals. In this, which I injected with much care, I have not been able to find that the veins in any part of the body, except in the liver, are dilated into receptacles for stagnant blood; and such is exactly the condition of the venous system that we might anticipate in animals whose submersion is only occasional, and that but for a short period at a time, when diving for their prey in shallow, inland waters. The liver being the organ, next after the heart nearest to the lungs, in which the obstruction takes place during the act of diving, its veins, as might be expected, partake first of the tendency to dilatation. In them, and perhaps in consequence of the temporary nature of the obstruction, not beyond them, does the blood need a resting place during the submersions of the animal.

In the animals, before spoken of, whose watery habitation is more extended and deep, and whose exercises, under water, in search of prey, or in evading enemies, are more prolonged, we find the provision of reservoirs more enlarged and more generally extended throughout the venous system of the body.

As we might be prepared to expect, a provision such as that

which exists in the otter, is present also in diving birds, in accommodation to their habits of remaining under water in search of the fish on which they prey. Those two injected preparations which I have placed on the table,—one of the great northern diver (*colymbus articus*), the other of the gannet (*anser bassanus*), by their contrast may serve as beautiful illustrations of this fact. In the diver the abdominal vena cava is vastly dilated; it is as large as the same vessel in the human body, and near its entrance into the right auricle forms a distinct bag, larger than that of the auricle itself. The jugulars are of great size; and the hepatic veins are much wider than they are ever found in birds not habituated to diving. In the gannet, on the contrary, which is also a sea-faring bird, but of a different character from the diver, which it nearly equals in size, there is no inordinate dilatation of the great veins leading to the heart: from its mode of seizing the fish on which it feeds, it stands not in need of such a provision. The gannet does not, like the diver, swim under water after fish; like an eagle it pounces on its prey from a height when discovered near the surface of the water, and then carries it up to some dry spot impaled on its long, sharp bill. Not being necessitated, like the diver, to lengthened delays under water, it is not furnished with those provisions, so amply given that bird by nature, to obviate the derangements which its circulating and respiratory organs are exposed to, during protracted efforts of submersion.

It would be an interesting subject of inquiry, to ascertain whether in pearl-divers, or persons whose habits of life lead them to daily, long-continued submersion, any such provision as this is superinduced. We know that under any long-continued obstruction to the free passage of blood through the veins in any part of the body, these vessels easily yield to the distending force, and increase much both in thickness and calibre; and it is not going too far, to offer a conjecture, that under circumstances such as those alluded to, some degree of enlargement in the great veins about the heart may be effectuated. The amount of dilatation would not, of course, at all approach to that in the animal naturally inhabiting the water, with whom man could never cope as a diver; for, whilst the whale can stay under water for twenty minutes at a time, it is now well known that no pearl-diver has ever been able to remain down so long as two minutes. At all events, the theory is more rational, and more reconcileable with the established laws of the body, than one which for a long time was entertained—namely, that in those individuals, the foramen ovale is open, and a passage thereby given for the accumulated venous blood to pass from the right, directly into the left ventricle.

A fact has been suggested to me, by my friend Dr. Wm. Stokes, realizing in some measure the anticipations which I had formed, respecting the effects of obstruction in the venous system in the human body, as being likely to resemble the condition alluded to in this paper, in animals subjected by their peculiar circumstances of life to long-continued stagnation of blood at the lungs. It is the occurrence of a dilated and varicose state of the vena cavae and vena hepaticæ in individuals

labouring under permanent obstruction of the venous blood in the lungs, or right cavities of the heart, causing swelling of the liver, and dropsey of the limbs, which is removable by the horizontal posture and rest, but which returns again as soon as the circulation is quickened or disturbed. This fact was first noticed by Andral and frequently since witnessed by Dr. Stokes.

The effect on the venous circulation is in this case exactly analogous to that of prolonged diving, in animals habituated to the act, with the exception that in the latter the obstruction being only temporary, and the provision for the reception of the stagnant blood being a natural one, the tone and power of the vessels is unimpaired, and no injurious effects remain after the obstruction ceases, whilst in the former the impediment to the flow of the blood being permanent, and the enlargement of the veins being attended with a thinning and loss of elasticity in their tunics, the accumulation becomes a source of evil.

To appreciate the necessity for a provision in diving animals, such as that, the exposition of which we have been engaged in, it is only necessary to bear in mind, that such is the difference between the effects of the venous and arterial blood on the functions of the body, in warm-blooded animals, that it is essentially necessary they should be confined to their own respective vessels, and not mixed up with each other, as has been supposed by some to occur in divers. The blood of the jugular vein, sent back directly to the brain by the carotid artery, (an experiment of the celebrated Bichat), caused instant death to the animal.

In that malformation of the heart, where the foramen ovale, continuing open to adult age, allows the venous blood of the right auricle to become mixed with that in the left, which has been rendered arterial by passing through the lungs, the most striking and grievous inconveniences, and even death, accrue from the admixture. In this deviation from the natural form of the heart, the circulation is conducted without much embarrassment during infantile life, or when the individual, having grown up to manhood, preserves the body in a state of quietude, allowing, thereby, the streams in the heart to pass each other without much intermixture. But great difficulty of breathing, oppression of the heart, fainting, and general blueness of the body, are the immediate consequences of such bodily efforts in running, leaping, or such other exercises as can, by hurrying the venous blood towards the right auricle of the heart, cause it to flow through the unnatural passage into the left, and become there mixed with the arterial blood in its way towards the different organs of the body.—The venous blood can never, in warm-blooded animals, be mixed up with the arterial with impunity; neither, on the same principle, can that description of blood be allowed to pass from the extremities of the veins in the lungs, into the commencement of the arteries, without undergoing that change, from the action of the air, which suits it for transmission into these vessels. Unusual accumulation of venous or arterial blood may take place in their respective vessels, but as any

intermixture of the two is fraught with danger to the living animal, nature has taken particular pains to keep them apart.

The reservoirs then, which we have seen to exist in the course of the veins leading to the lungs and heart in aquatic-mammalia and birds, by allowing a temporary resting place for the blood when stopped in its free course during the obstruction to respiration which occurs in the act of diving, are perfectly compatible with the established laws which regulate the movements of the fluids in living bodies, and absolutely necessary towards the existence of these animals under the circumstances in which they are placed.

In making this communication, I wish it to be understood, that I do not put it forward as altogether new. Notices of several of these venous dilatations are to be found scattered among the writings of comparative anatomists, but, however, without any particular object or use being assigned to them, or the principle on which the necessity for them is founded being explained. I have joined these facts together, I have confirmed the accuracy of them all by dissection, and added several new ones from my own observation; and the whole has appeared to me worthy of being communicated to this Association.

Mr. HARGRAVE said that he thought there was a peculiar structure in the seal, which had a tendency, under such circumstances, to prevent the blood of the inferior cava and hepatic veins, from accumulating in the right auricle. If the diaphragm in this animal be examined, it will be found that the opening through which the inferior cava passes into the chest is muscular, so that when the animal is submerged, the inferior cava is constricted by these muscular fibres, and the blood compelled to remain in the abdominal branches of the vena cava. The same provision, but less perfect, is seen in the otter. With reference to the circulation in the human subject, he thought that the liver was occasionally used as a kind of diverticulum, to relieve the heart and lungs in extreme cases. If the venae cavae hepaticæ be examined in their passage from the liver to join the inferior cava, it will be found that they communicate with it within the tendinous opening of the diaphragm, so that if there be any thing in the condition of the heart, to prevent the blood from passing into the lungs, it first passes into the venae cavae hepaticæ, (which are connected with the liver by a dense unyielding structure, and therefore always patent,) and afterwards into the inferior cava. Hence he should expect, that in the pearl-divers there would be dilatation of the inferior cava and vena cavae hepaticæ. We are all aware of the great quantity of blood which is occasionally thrown on the liver. To this occurrence Mr. Hargrave was inclined to attribute the pain of the right side, felt after running or violent exercise. In such cases the action of the heart is not sufficient to get rid of the vast quantity of venous blood thrown upon it, and it accumulates in the liver. It was a common habit with persons who took exercise, in which they were obliged to run a great deal, to tie a bandage over the waist, and

thus endeavour to support the liver, in its over-distended state, by means of mechanical pressure.

Professor ALISON remarked, that the pain in such cases, was not confined to the region of the liver, but extended across the epigastrium, and to the left hypochondrium to the situation of the spleen.

Dr. HOUSTON said that in the venous congestion, which accompanied the cold fit of an intermittent, the spleen was as much or even more affected than the liver, being occasionally so much distended as to form a perceptible tumour in the abdomen.

Dr. HARRISON begged leave to call the attention of the meeting to a similarly dilated state of the hepatic veins in fishes. He conceived that these veins were receptacles for the accumulated blood, under certain circumstances, which he was about to detail. He had examined the process of respiration in fishes, and found that under certain circumstances, this process is suspended in a very remarkable manner. When a fish is placed in clear water, and left at rest, the process of respiration may be seen in a very satisfactory manner.—The jaws are moved rapidly, and the water is seen streaming out through the apertures in the gills. But if you put a rod into the water, and agitate it, so as to tease and alarm the fish, the process of respiration is immediately arrested, and continues so long as you continue to tease the animal. It struck him therefore, in accordance with the views developed in Dr. Houston's paper, that in cases where fish are exposed to alarm, as in flying from danger, the process of respiration is suspended, and therefore it would be natural to expect some provision in the venous system of these animals, to meet the exigencies of the case. He had been frequently surprised at the length of time he could stop the respiration in fishes, by teasing them in the manner described. After he had ceased teasing them, he observed that they began to breathe with great rapidity. With reference to Mr. Hargrave's observations, he believed that there was no question as to the muscular structure of the diaphragmatic opening for the inferior cava in the seal. He thought, however, that when respiration was suspended, the diaphragm ceased to act. If, therefore, there was any compression on the cava during the suspension of respiration, the diaphragm in this animal must act in a manner different from its ordinary mode. It was, however, true, that experiments had proved the action of the heart to be less dependent on the nerves of that organ than on the process of respiration, and he was willing to allow that this might be urged in explanation of the diaphragm, (which is in part an involuntary muscle, and intimately connected with the process of respiration,) being capable of contraction during the suspension of respiration. Moreover, it could scarcely be supposed, that a muscular structure of this kind could exist without having some determinate use.

Mr. HARGRAVE said, he did not think that the diaphragm of the seal was in a relaxed state during the submersion of that animal. Before submersion, the animal takes in a full inspiration, and thus accomplishes a double object; he fills the chest with a large supply

of air, and the contraction of the diaphragm, which accompanies the act of inspiration, tends to compress the inferior cava.

Mr. ADAMS remarked, that certain morbid changes, to which the heart was liable, placed the person so affected in the situation of the diver. He had noticed this particularly in cases of diseases of the left auriculo-ventricular opening. In all these cases the left auricle was enlarged, the pulmonary veins very much dilated, the lung obstructed, the veins of the liver congested; there was pulsation of the jugular veins, and congestion of the brain. He wished to connect the views of comparative anatomy, which had been developed by Dr. Houston's communication, with what he had observed in cases of disease. He referred to the difference in structure between the valves at the right and left side of the heart, the valve of the right side, or tricuspid, being much more imperfect than that of the left side, and permitting the regurgitation of blood much more freely. This imperfection, however, was an advantage; for if the tricuspid was as perfect as the mitral valve, disease of the right side of the heart would be much more frequent. This was the explanation of rupture of the mitral valve being a circumstance of not unusual occurrence; while the tricuspid valve was never ruptured.

Dr. HART stated that he had seen a case of rupture of the tricuspid valve. He differed from Mr. Adams with respect to the structure of this valve, which he did not think less perfect than that of the left side.

Dr. JACOB begged leave to recall the attention of the meeting to the original paper. One of the questions to be disposed of was, whether these dilatations or cells, capable of containing a great quantity of blood, existed in any degree in diving animals as a consequence of the extreme pressure to which they were occasionally exposed. He thought the office of compensating for any condition arising from pressure could not be assigned to these cells. One fact in favour of the conclusion, that pressure has nothing to do with the existence of these cells is, that in many of the aquatic mammalia that do not descend to great depths, they are comparatively as large, or even larger, than they are in those who dive far below the surface. The otter, which inhabits shallow waters, and the seal, which lives about the shores, have them comparatively as large as the cetacea. We must, therefore, look for some other cause, and this cause Dr. Jacob considered to be connected with the suspension of respiration. It would appear that the existence of cells was a provision to prevent the continuance of the circulation of venous blood during the suspension of respiration, which would otherwise pass through the lung without the advantages derived from being corrected by atmospheric air. It is therefore a provision in connexion with the respiratory function, and this is a proof that the circulation of venous blood is calculated to prove destructive to life; and perhaps this is the reason for the existence of such a provision, more than the pressure on the surface. Dr. Jacob referred to the vast number of arterial ramifications which may be observed spreading up along the neck and

thorax in diving animals, and first pointed out by Tyson and Hunter. These form a kind of arterial reservoir or diverticulum, a provision which perhaps may be made available, when the blood cannot pass any farther in the extreme vessels.

Dr. WILLIAMS of London observed, with reference to Dr. Houston's experiment of suspending respiration in the rabbit by passing a ligature round the trachea, that the result of that experiment proved rather that there was a great accumulation of blood in the veins about the right side of the heart, than that the circulation through the lung was wholly suspended. He would beg leave to put a question to Dr. Houston—whether the construction of the lung in these animals had been examined, and whether there might not be, in connexion with this power of adapting the system to an accumulation of venous blood, some provision by which a greater quantity of air might be taken in, so that a certain quantity of arterial blood might be formed during the process of submersion?

Dr. HOUSTON did not think that any such provision as that alluded to by Dr. Williams existed in these animals. On the contrary, if the lung of a porpoise be examined it will be found to be more fleshy, and therefore to have less room for containing air than that of land animals. He did not wish it to be understood that he meant to say, that the circulation was completely suspended during submersion. He thought it might go on very slowly, and in such quantity as not to do any mischief. With respect to Dr. Jacob's opinion, as to diving animals not suffering from pressure at great depths, he thought the question still open for discussion. He considered that under such circumstances these animals must suffer great pressure, and was it to be conceived that the superficial blood-vessels would escape its influence.

Dr. JACOB stated, in reference to the question of Dr. Williams, that the actual air cells in the porpoise resembled those in the human subject. The matter, however, was one of considerable interest and worth following up. In dissecting, some time back, the *Delphinus Delphis*, he had found a state of the lung differing from any thing he had seen in the mammalia. This existed in the form of a flap, which projected from the body of the lung, and appeared to have been folded up. He had laid the lung aside for further investigation, but unfortunately lost sight of it afterwards. He would recommend the investigation of this point to any gentleman who had an opportunity of dissecting the cetacea, and it would be a subject for inquiry, to ascertain whether these animals had cavities for detaining air, not possessed by other mammalia. There was one fact connected with the history of these animals worthy of attention, namely, that the lung was very liable to disease. He had frequently found a morbid structure in them resembling scrofulous tubercles, and, in some instances, had found the bronchial tubes so stuffed with entozoa, as to have materially obstructed respiration.

Dr. WILLIAMS mentioned an experiment related to him by Professor Faraday, who found that he could bear the privation of air for

a considerable time by a very simple process. By making several successive forcible expirations and inspirations, he observed that he could remain for a considerable time without breathing. It would appear that by this process the whole air in the lungs is completely changed; all the bad air is removed, and good air substituted. The question was, however, still open for discussion, whether the lung in these animals may not have the power of retaining air by compression, or some other means, and whether the tense structure and absence of porosity observed in their lungs, may not contribute to this.

Dr. CORRIGAN agreed with Dr. Williams as to the circumstance of lungs which had less porosity being more capable of acting on the air. We do not find that when the lungs become more fleshy and tense that they are less capable of acting on the air; on the contrary, it is when they become thin and emphysematous, they are least capable of purifying the blood.

Dr. HOUSTON stated that what he spoke of was, the capacity of the lung to hold superabundant air. Of two lungs of equal size, that which was least fleshy, would hold most air. He merely spoke of the lung as an organ to receive and contain air.

Dr. ALISON observed, that in a dolphin which had been lately dissected at Edinburgh, no provision to retain air had been discovered.

Dr. HARRISON observed, that as it was growing late, and as it was necessary to prepare a report of the proceedings for the general committee, he should move the adjournment of the section.

SECOND DAY.

Tuesday, August 11.

Dr. PRICHARD in the Chair.

Dr. HARRISON commenced the proceedings by reading the Report of the Dublin Committee, on the motions and sounds of the heart.

"The formation of a committee in Dublin, to inquire into the successive motions of the different parts of the heart, and the sounds that accompany them, having been recommended by the British Association, and Dr. Macartney, the Professor of Anatomy and Surgery in the University of Dublin, having been requested by the Association to select a number of gentlemen for that purpose, the following were nominated by Dr. Macartney, and with him formed the committee:—Dr. Jacob, Dr. Hart, Dr. Ephraim M'Dowell, Dr. George Greene, Dr. R. Law, Dr. Evory Kennedy, Dr. Bruce Joy, Dr. John Nolan, Mr. Adams, Mr. H. Carlile, and the Rev. G. Sidney Smith, F. T. C. D. Of the gentlemen so appointed those whose names are signed to this Report, acted on the Committee, and attended at the experiments.

"The Committee having met several times, and having considered

the different opinions hitherto advanced on the subject of the motions and sounds of the heart, proceeded to institute a series of experiments, the subjects of which were generally young calves; in which animals the heart is sufficiently large to admit of the motions and sounds being accurately observed, while their early age is favourable to the prolongation of the experiment, as it has been ascertained that the vitality of the different organs is more enduring, and less influenced by injuries to the individual, in animals at a very early age, than in those of a maturer growth. The pulse varied in the subjects for experiment from 76 to 80.

"The animals were prepared in the following manner:—a tube connected with a pair of bellows was inserted into the trachea, and the sensibility of the animals having been destroyed by a blow on the forehead, artificial respiration was commenced, by means of which the heart was enabled to continue its pulsations for a period varying in different subjects from one hour to two. The Committee had been disappointed in their endeavours to procure some of the woorma poison, which has been used in similar experiments in London; and found, that the employment of prussic acid, in a quantity sufficient to suspend the sensibility of the animal, destroyed, in a few minutes, the power of motion in the heart.

"SECTION I.—*Experiments on the Motions of the Heart.*

"*Experiment 1.*—A calf, two days old, having been secured on its back, and prepared as above described, the sternum and a portion of the ribs on both sides were removed, when the following motions were observed. The heart was beating strongly, at the rate of 144 pulsations in the minute, but in a short time fell to 80. While still enclosed in the pericardium, the heart was observed to have a slight libratory motion on its longitudinal axis, which motion, it may here be remarked, may assist in explaining the phenomenon of *frottement* in disease. On cutting open the pericardium, and turning it aside, both the auricular appendices were seen to project with a rapid motion upwards, or towards the place of the sternum, and immediately afterwards to recede. When coming forwards, they were swollen and soft to the touch; When receding they became hard to the touch, were diminished in size, and flattened. Immediately after the recession of the auricular appendices, the ventricles with a rapid motion assumed a somewhat globular form in their middle part, which projected towards their sternum, and their apex at the same time was pushed considerably in the same direction. During their continuance in this state, the ventricles were hard to the touch, and if grasped by the hand, at the commencement of the movement, they communicated a shock or impulse, and separated the fingers. When the ventricles had remained for a short time in the state just described, they suddenly sank downwards or towards the spine, and became elongated, broad and flat, and soft to the touch.

"This succession of motions having been observed for some time, a small glass tube was introduced through a puncture into the left au-

ricular appendix, and the blood was seen to rise in the tube during the recession of the appendix, and to subside during its upward movement. A similar tube was introduced through a puncture in the right ventricle, and a jet of dark coloured blood was thrown forth during the globular and hardened state of the ventricles, and subsided when they became flattened and soft. A puncture was made in the pulmonary artery, close to the ventricle from which it arises, and through it a stream of blood issued synchronously with the jet from the tube in the right ventricle. A tube having been introduced through a puncture in the left ventricle, and one of the mesenteric arteries having been exposed and opened, the jet from the ventricles was observed to precede the jet from the arteries, by an interval easily appreciable. The femoral artery was opened, and a similar observation was made as to the interval between the jet from the left ventricle and the jet from that artery. Previously to opening the chest, the committee had satisfied themselves, that the beat of the heart, felt through the sternum and cartilages of the ribs, preceded the pulse, felt in arteries at different distances from the heart, by intervals of time which were proportioned to those distances: and they were also satisfied, that the jets of blood from the mesenteric and femoral arteries were synchronous with the pulses felt in these arteries.

“ *Experiment 2.*—In a calf, prepared as the former had been, and placed on its right side, a portion of the ribs on the left side was removed, the sternum and part of the cartilages on that side being left in their natural position, and the pericardium was opened. It was now seen that when the ventricles assumed their hardened state, their apex, and a considerable portion of their anterior surface were closely applied to the sternum, and when the hand was interposed between the latter and the surface of the ventricles, a strong compression was exercised on the fingers during each approach of the ventricles to the front of the chest. When the ventricles were in their softened state, their anterior surface, by which is meant the one corresponding to that called anterior in the human heart, was sometimes in contact with the sternum, and sometimes removed to a little distance from it, and from the contemplation of this, and the preceding experiment, the committee were satisfied, that the situation of the heart in the thorax is affected by the position of the body, as has been observed by others; for instance, that in the recumbent state, on the back, the heart recedes somewhat from the sternum: if the individual lie upon the face, the anterior surface of the ventricles is in constant apposition with the front of the chest, the pericardium of course being interposed. The yielding texture of the lungs, and the mode of attachment of the pericardium and the great vessels, are such, as to allow the gravitation of the heart to influence its position in different postures of the body. These experiments were repeated on different subjects, and the observations recorded above were confirmed.

Experiment 3.—A rabbit was stunned, and its heart immediately

taken out of the body and placed on the hand, with the anterior surface of the ventricles upwards. The ventricles continued to beat for some time, and assumed alternately the forms which have been described in the first experiment. During the continuance of the globular form, the body of the ventricles was protruded upwards, and their apex was considerably elevated from the hand: and while in this state, it was ascertained by measurement, with a pair of compasses, that the length and the breadth of the ventricles were diminished. On the collapse, or softened state of the ventricles, taking place, they became longer and flatter, and their apex sank towards the hand. The heart was now placed with the posterior surface of the ventricles upwards, and the globular swelling, in their middle part, was observed to alternate with the flattened form on this surface also; but the apex was not elevated as in the preceding part of the experiment.

“ *Experiment 4.*—The sternum of a frog having been removed, the following appearances were observed. The ventricle having become swollen, soft, and red-coloured, sank and diminished in size, and became pale and hard; alternating in these qualities with similar qualities in the auricle. It was manifest from the colour of both ventricle and auricle in their swollen state, that they were then full of blood; and from their softness, that they were in their diastole.—When they became pale and diminished in size, they were in their systole. During the diastole of the ventricle, its anterior surface was protuberant and approached the sternum, while its apex drooped towards the spine. In its systole, the anterior surface receded from the sternum, and its apex was slightly turned upwards or towards the sternum. The finger being applied to the ventricle during its systole, a slight shock or impulse was felt. In this experiment the relations between the sternum and the ventricle, during the diastole and systole of the latter, are nearly the reverse of those observed in the hearts of quadrupeds in the foregoing experiments. In these the ventricles approach the sternum, during the hardened state or systole, and recede from it in the softened state or diastole. This difference depends on the dissimilarity of the heart in warm and cold-blooded animals, and will be adverted to again.

“ *SECTION II.—On the Sounds of the Heart.*

“ *Experiment 5.*—A stethoscope was applied on the sternum, over the heart, in a calf in which artificial respiration had been established, and both sounds of the heart were distinctly heard; the first prolonged and dull, the second abrupt and clear. The sternum and ribs were removed, so that the heart beat free from the contact of any part of the thorax, and a stethoscope, connected with a flexible tube and ear-piece, having been placed on the pericardium, over the ventricles, both sounds were distinctly heard. In the experiments on the sounds of the heart, with the sternum removed, the flexible ear-tube was found to be serviceable in preventing the transmission of the shock or

impulse, which was felt when the common stethoscope was used, and which embarrassed the observation. The ear was now applied very near to, but not touching the heart, and both sounds were distinguishable, but feeble. A small piece of board was placed over the surface of the ventricles, and kept in contact with the pericardium, and the common stethoscope having been applied to the surface of the board, both sounds were heard as distinctly, and very nearly as strongly, as when heard through the sternum. The ear-tube was placed on the ventricles, near their apex, and in this condition, the first sound was very distinctly heard; the second sound indistinctly. When the tube was placed over the origins of the large arteries, both sound were heard distinctly, particularly the second sound. The pericardium was distended with tepid water, and in that state, both sounds were heard, but not so clearly as before the injection of the water.

“ *Experiment 6.*—In a calf, prepared as before, the sternum and ribs having been removed as in the last experiment, and the pericardium having been cut away, both sounds were listened to with the ear-tube applied to the different parts of the ventricles, with the same result as in the last experiment. The great arteries were compressed close to the heart, and the character of the second sound was altered; and at times it seemed to some of the Committee that the second sound was lost, the first sound remaining unchanged. A fine curved needle was passed into the aorta, and another into the pulmonary artery, beneath the line of attachment of one of the semilunar valves in each vessel, and the needles were passed about half an inch upwards, and out again through the respective vessels, so as to confine a valve in each, between the needle and the side of the artery: upon applying the ear tube over the origins of the arteries, it was found that the second sound had ceased, and that a sound resembling the first in character, and coinciding with the systole of the ventricle, was still audible. Some of the members of the committee thought that the sound just mentioned was prolonged beyond the usual duration of the first sound, as heard before the introduction of the needles; and towards the termination of the experiment, it was observed by some of the committee, that there seemed to be a repetition of the first sound, or two prolonged sounds similar in character, and which might be called rushing sounds.

“ When the heart was removed from the body, and the semilunar valves examined, it was found that one valve in each artery had been confined against the side of the vessel, so as completely to prevent its descent. It may be remarked, that this operation may be performed with great ease, and almost with certainty of success.

“ *Experiment 7.*—The foregoing experiment was repeated on another calf, and with the same result, the cessation of the second sound. During the experiment, the second sound, somewhat modified, was heard to recur; and upon examination it was found, that the needle, which had been passed into the aorta, had slipped out.

On its being replaced, the second sound again ceased. On taking out this heart also, the valves were found to have been confined, as stated in the last experiment.

“ *Experiment 8.*—A calf having been stunned, the heart was taken out immediately, and placed on the table. The ear-tube was applied to the surface of the ventricles whilst they were still beating, and at each systole a sound was heard resembling that called the first sound; no second sound was audible. When the heart had ceased to beat, the semilunar valves were destroyed, the ventricles were filled with water, and the heart being held upright, the ear tube applied to the ventricles, and these compressed by the hand, so as to cause a rush of water through the arterial trunks, a sound resembling the first sound was heard; also, when the grasp of the hand was suddenly relaxed, a sound was heard of the same character as the preceding. The ear-tube having been applied to the ventricles in the dead empty heart, and their internal surfaces being caused to rub against each other, a sound somewhat resembling the first sound was heard. The finger having been introduced into the left ventricle through the auriculo-ventricular opening, and gently rubbed against the internal surface, a sound was produced resembling the first sound, and heard by the ear-tube applied externally to the ventricles. A glass tube, allowed to drop from a small height on the semilunar valves of the aorta, before they had been destroyed, caused a sound having the character of the second sound; and when the tube was introduced between the valves, and gently rubbed up and down, a sound resembling the *bruit de rdpe* was heard.

“ *SECTION III.—The successive Motion of the different Parts of the Heart.*

“ From the experiments on the motions of the heart, the following conclusions may be drawn: 1. In the heart of warm-blooded animals, the systole of the ventricles follows immediately the systole of the auricular appendices. 2. During the systole of the ventricles, the auricles are distended by blood from the venous trunks. 3. When their systole has ended, the ventricles become relaxed and flaccid; and blood passes rapidly, but not with force, from the auricles into their cavities. 4. The auricles are never emptied of their blood, and contract but little on their contents, an active contraction being observable only in their appendices. 5. If the interval between two successive beats of the heart be regarded as divided into four equal parts, two of these parts may be allotted to the duration of the ventricular systole; something less than one to the interval between the termination of the ventricular systole, and the beginning of the diastole of the appendices, during which interval little motion is observed in the auricles; and the remainder to the diastole and systole of the auricular appendices. 6. The ventricles, in their systole, approach the front of the thorax; and by their contact and pressure against it produce the impulse or beat of the heart. 7. The beat of

the heart and the pulse in the arteries are synchronous, only, when the pulse is felt in arteries close to the heart: in those at a distance, the pulses are later than the beat of the heart, by intervals of time proportioned to the distances.

" In the heart of the frog, which was examined in the fourth experiment, the ventricle swelled, and approached the sternum in its diastole, and receded from its systole. This difference between the movements of the heart in that animal, and in the other subjects of experiment, may be explained by considering, that in the heart of the latter the swelling of the ventricles, during systole, is produced by the thickening of their muscular fibres, which are then in a state of contraction; and of which the mass bears a large proportion to the size of the internal cavities, while in the heart of the frog, the sides of the ventricle are thin, and the cavity is large, and the increase of thickness of the sides of the ventricle caused by the contraction of their fibres, is more than counterbalanced by the diminution of volume of the ventricle attendant on the expulsion of its contents.

" SECTION IV.

" From the experiments on the sounds of the heart, it appears to follow: 1. That the sounds are not produced by the contact of the ventricles with the sternum or ribs, but are caused by motions within the heart and its vessels. 2. That the sternum and front of the thorax, by their contact with the ventricles, increase the audibility of the sounds. 3. That the first sound is connected with the ventricular systole, and coincides with it in duration. 4. That the cause of the first sound is one which begins and ends with the ventricular systole, and is in constant operation during the continuance of that systole. 5. That it does not depend on the closing of the auriculo-ventricular valves at the commencement of the systole, because such movement of the valves takes place only at the commencement of the systole, and is of much shorter duration than the systole. 6. That it is not produced by the friction of the internal surfaces of the ventricles against each other, as such friction cannot exist until the blood has been expelled from the ventricles, whereas the first sound commences with the beginning of the ventricular systole. 7. That it is produced either by the rapid passage of the blood over the irregular internal surfaces of the ventricles on its way towards the mouths of the arteries, or by the *bruit musculaire* of the ventricles, or probably by both these causes. 8. That the second sound coincides with the termination of the ventricular systole, and requires for its production the integrity of the semilunar valves of the aorta and pulmonary artery, and seems to be caused by the sudden check given by the action of these valves to the motion of the columns of blood driven towards the heart after each ventricular systole by the elasticity of the arterial trunks.

" The Committee wish, in concluding this Report, to express their opinion, that although much light has been thrown on the sub-

ject of the Motions and Sounds of the Heart, by recent investigations, here and elsewhere, the nature of the inquiry is such as renders it difficult in many instances to arrive at satisfactory conclusions. They also think that the subject, from its importance, whether in a practical view, or as an object of philosophical inquiry, is deserving of further investigation.

“ *Signed,*

- “ ROBERT ADAMS, A. M., Lecturer on Anatomy and Surgery; Surgeon to Jervis-street Hospital, &c.
- “ ROBERT LAW, A. M., M. D., Physician in Ordinary to Sir P. Dun’s Hospital.
- “ GEORGE GREENE, A. B., M. D., Fellow of the College of Physicians; Lecturer on the Practice of Medicine; and one of the Medical Inspectors of the House of Industry.
- “ EPHRAIM M'DOWEL, M. D., M. R. I. A., Censor of the Royal College of Surgeons; one of the Surgeons to the House of Industry.
- “ BRUCE JOY, M. D., Fellow of the College of Physicians.
- “ JOHN NOLAN, M. D., Demonstrator of Anatomy in the University of Dublin.
- “ EVERY KENNEDY, M. D., Master of the Lying-in Hospital.
- “ HUGH CARLILE, A. B., Demonstrator of Anatomy in the University of Dublin.”

Mr. HARGRAVE moved the thanks of the meeting to the Dublin Committee for their very able and elaborate Report.

The motion was seconded by Dr. ALISON, and passed unanimously.

Dr. WILLIAMS said he would occupy the attention of the meeting for a few minutes, in stating the results of his experiments on the subject before the Section. Some of the details mentioned by the Committee were confirmatory of these results, others not. He should abridge as much as possible the remarks he had to make on the subject, as they were already before the public. In making these experiments, he undertook the task himself, in consequence of Dr. Hope’s engagements not permitting him to do so; he had not been able to secure Dr. Hope’s cooperation, but he had been able to secure his presence and testimony. He was happy to find that some of these experiments were confirmed by the admirable investigations detailed to the meeting; these went farther than the experiments he had made, for he considered many of the points in question had been settled beforehand. He had merely directed his attention to such

matters as admitted of further discussion. From the statements mentioned in the appendix to his work on auscultation, it may be considered, first, that the auricles contract first, producing no sound. Secondly, that the auricular contraction is immediately followed by the ventricular systole, which is accompanied by the first or dull sound. This systole, by straightening the anterior convexity of the ventricles, brings their apex into forcible contact with the ribs, and thus the impulse is produced. This systole, by throwing an additional quantity of blood into the arteries, causes the arterial pulse, which in the arteries near the heart is synchronous with the ventricular systole, but in those more distant, succeeds it at an interval occupied by the transmission of the wave through the blood along the elastic tubes from the heart. Thirdly, that the ventricular systole is immediately followed by the diastole, which is accompanied by the second or short sound. Fourthly, that there is an interval of rest, at the conclusion of which the auricles contract, and the series of motions are repeated as before. It was still, however, uncertain, in what way the ventricular systole produced the first sound, or how the diastole developed the second. Thus, the first sound was ascribed by Mr. Carlile to the rush of blood into the great arteries; by Mr. Rouanet and others, to the closing of the auriculo-ventricular valves; by Dr. Hope, to the collision of the particles of fluid in the ventricles; and by Dr. Williams, to the muscular contraction itself. The second, or short sound, was ascribed by Dr. Hope to the impulse of blood from the auricles refilling the ventricles; by M. Rouanet, Mr. Carlile, M. Bouillaud, and others, to the reaction of the arterial columns of blood against the semilunar valves.

Through the kindness of Sir B. Brodie, Dr. Williams had been able to procure some of the woorara poison for his experiments. This poison suspends the sensibility of the nervous system, without acting on the irritability of the heart, and is much better adapted for such experiments than any other substance. As the next best substitute, Dr. Williams would recommend the essential oil of almonds. In his experiments, the heart continued to beat vigorously, for more than an hour after the extinction of animal life. In the first experiment, twenty grains of the woorara, moistened in water, were inserted into an incision in the haunch of a young donkey; the animal died in fifteen minutes. The chest being opened, by cutting away the cartilages and breaking three of the ribs on the left side, and the heart exposed, its pulsations were observed to be regular and vigorous, the auricles contracting before the ventricles. The double sound was distinctly isochronous with the systole and diastole of the ventricles. The following observations were then made. 1st. The first sound was equally audible on all parts of the ventricles. 2nd. The second sound was most distinct over the origins of the great arteries. 3rd. Pressure on the origins of these arteries stopped the second sound; slight pressure, in the same situation, caused a whizzing or bellows' murmur, with the first sound. It was proposed by Dr. Hope, that this pressure should

be applied immediately after the systole and before the diastole of the ventricles, but this was found impossible. 4th. On pushing the auricles into each auriculo-ventricular opening, the ventricular contractions became weak and irregular; but the first sound, though weak, was heard alone. In this experiment Dr. Williams could feel with his finger, that peculiar kind of tumultuous struggle, which happens in cases where the transmission of blood into the ventricles is impeded. 5th. At each systole the sudden tension of the ventricles was felt, communicating an abrupt shock to the finger, with which the first sound was synchronous. The first action in the systole is a kind of corrugation of the fibres; after the diastole, the heart is so relaxed, that its first action is to bring the fibres into a state of sufficient tension, to act in expelling the blood. 6th. The left auricle was cut open, and the mitral valve partially destroyed; the blood issued in jets at each ventricular systole. The first sound still accompanied the systole, the second was no longer audible. 7th. The right auricle was cut open; the first sound still continued. Dr. Williams remarked, that when the ventricles became so weak, as to be unable to send the blood into the great arteries, the second sound ceased. This would appear to prove, that the cessation of the second sound was not to be attributed merely to interference with the action of the valves, but also to the passage of blood into the great arteries. 8th. A finger being passed into the left ventricle, and the influx of blood into both being prevented, they still continued to contract, particularly when irritated by the nail, and the first sound was still heard, but not so clearly as when the ventricles contracted on their blood. 9th. The same phenomena were observed, when the aorta and pulmonary artery were severed from the heart. Until the auricles were cut open, the second sound was audible, in all the strong pulses of the heart, but not afterwards.

In Dr. Williams' second experiment the following points were observed. 1st. Both sounds were heard through the pericardium, though the heart did not touch any part of the chest. 2nd. Both sounds were heard distinctly through a lobe of the lung, interposed between the heart and the stethoscope. These experiments are in direct contradiction to the opinions of M. Majendie. 3rd. The second sound was observed to be most distinct at the origin of the aorta and pulmonary artery; on the body of the ventricle it was heard less distinctly, and appeared more distant. 4th. When the stethoscope was applied on the aorta, three inches from its origin, the second sound (without the first) was heard following the systole of the ventricle, as felt by the finger. At a distance less than three inches, both sounds were heard, the first feebly. 5th. Compression of the aorta and pulmonary artery caused the first sound to be accompanied with a bellows' murmur, and the second to cease, while the compression was continued. 6th. A hook was passed into the pulmonary artery to prevent the closure of its valves; the second sound was weakened, and a hissing murmur accompanied it. A common awl

was passed into the aorta in the same way ; the second sound ceased, and was replaced with a hissing. 7th. The hook and awl were withdrawn, the second sound returned, and the hissing ceased. Dr. Williams remarked, that from the coarseness of the instruments employed, there might be some difference between what he heard and what had been heard by the committee. 8th. The pulmonary artery was cut open and the finger introduced into the right ventricle ; the first sound alone was obscurely heard. 9th. Slight contractions took place after the ventricles were laid open, and the columnæ carneæ were seen to contract simultaneously with the ventricles.

From these experiments Dr. Williams would conclude : 1st. That the first sound is not caused by a rush of blood into the arteries, as shown by several of the observations detailed. 2nd. That the first sound is not caused by the closing of the auriculo-ventricular valves, as shown by those observations in which it continued, though the closure of these valves was partially or completely prevented. 3rd. That the first sound is not produced by the collision of the particles of fluid in the ventricles, as proved by observations 4, 8, and 9 of experiment 1. 4th. *That the first sound is produced by muscular contraction*, as proved by observations 8 and 9 of experiment 1. 5th. *That the second sound is produced by the reaction of the arterial columns of blood tightening the semilunar valves at the ventricular systole*. Dr. Williams referred to various observations on the foregoing experiments in proof of this view of the question. In illustration, he remarked, that if a fold of linen or of a handkerchief be suddenly tightened, a sound will be produced which may serve to explain the second sound. It is the sound produced by sudden motion with resistance. He had always argued, that as rapid muscular motion in any other situation will produce sound, there is no reason why the same thing should not also occur in the case of the heart. In the experiments which were made by excluding the blood, and causing the ventricle to contract merely on the finger, he had observed that the contraction was not so rapid, nor was the sound so abrupt as when the ventricle acted on the blood, and that it bore a close resemblance to the sound of muscular contraction in general. He thought that the action of the auriculo-ventricular valves and the cordæ tendineæ might have some share in the production of the first sound, but it depended chiefly on the contractile tenseness of the walls of the ventricles. With respect to M. Magendie's views, all that he could concede was, that in case of violent action of the heart, its strokes against the chest may constitute the termination of the second sound, forming a kind of knocking action ; but in its ordinary and healthy state, the heart does not produce any sound by striking against the chest ; its apex glides upwards over the smooth surface of the pericardium, producing an impulse but not a sound. Another error was, that the sounds of the heart were louder when that organ was confined within the chest ; as if the parietes of the latter acted as a kind of sounding board. . If this were the case, and if the sound

depended on the impulse against the side of the thorax, the sound would be propagated all over the chest according to a well known law in acoustics, and would be as audible over any part of the back as over the cartilages of the sixth and seventh ribs.

In conclusion, Dr. Williams begged leave to return thanks to the meeting for the kind attention with which they had listened to him. He was at present engaged in a series of pathological experiments and observations, from which he expected to be able to throw much additional light on the diseases of the heart as well as on its healthy actions. He hoped that the investigations on the motions and sounds of that organ would be continued carefully and with due attention to the facts now brought forward. In the pursuit of these inquiries, he would recommend an attentive study of the laws of sound, a matter which had been hitherto much neglected.

Dr. GRAVES said that he thought the meeting was in a fair way of obtaining much valuable information. He would therefore suggest, that the members of the Committee should take up the subjects individually, and apply themselves to the various points of difference between them and Dr. Williams, in order to show in what they differed and in what they agreed.

Dr. GREENE asked for an explanation of the hissing sound, as stated to have been heard by Dr. Williams when the action of the semilunar valves was interrupted.

Dr. WILLIAMS conceived that it was produced as in cases where the aortic valves are imperfect or diseased.

Mr. DICK, of Edinburgh, said he was highly gratified with the very able Report of the Committee, but there were some circumstances in that report which did not accord with his experience. From some experiments which he had made on horses, he was induced to think, that with regard to the precise time at which the first sound occurred, it was not during the contraction, but during the dilatation of the ventricle, and that it was the dilatation of the ventricle which produced the impulse. With respect to the second sound, he thought that it was produced by dilatation of the aorta, and this view of the question appeared to be confirmed by the experiments of Dr. Williams.

Dr. GREEN asked what facts had Mr. Dick to prove that the impulse of the heart was caused by the dilatation of the ventricles? The Committee were prepared with proofs to shew that the impulse accompanied their contraction.

Dr. CORRIGAN said, that a series of experiments performed by himself and Dr. Hunt, some years back, were among the first undertaken with the view of illustrating the points in question. The difficulties attendant on this subject were very great; experiment after experiment had been performed without arriving at a satisfactory explanation. Senac states, that when the motions of the heart became for the first time a matter of dispute in France, it was proposed to settle them beyond the possibility of doubt by actual experiments, and

living animals were examined for that purpose, in the presence, not of a few, but of hundreds; and yet, strange to say, the meetings closed without coming to any conclusion. To come down to the present time, he might mention a mistake made by Laennec, who stated that the ventricles contracted before the auricles. It was, however, unnecessary to dwell on this point, as it was now generally agreed that Laennec was wrong. He thought there was still a good deal of confusion with respect to our ideas on the motions and sounds of the heart. At the time he was engaged in making his experiments on the motions and sounds of the heart, two others were also engaged without his knowledge in similar investigations; these were Dr. William Stokes and Mr. Hart of this city, and it had given him much pleasure to find that the result of their experiments coincided with those made by Dr. Hunt, Dr. Ferguson, and himself. About the same time the subject had been taken up with similar views by M. Pigeaux, at Paris. The publication of Dr. Corrigan's experiments attracted the attention of Dr. Hope, who instituted a series of experiments, the result of which went to contradict his experiments as well as those made by Dr. Stokes, Mr. Hart, and M. Pigeaux. These experiments of Dr. Hope were all said to have been verified by several eminent practitioners in London, and it is a curious fact, as shewing the difficulties attendant on such observations, that the conclusions come to by the Dublin Committee, after a most patient and accurate examination, are totally different from those put forward by Dr. Hope, in the appendix to his work. There was also a remarkable discrepancy between the original and subsequent statements of Dr. Hope. In the first publication of his experiments the first sound of the heart is attributed to the friction produced between the particles of the blood and the inner surface of the ventricles; in the last edition of his work the first sound is said to be entirely independent of that friction. In his first paper, Dr. Hope's observations go to prove, that the second sound arises from the dilatation of the ventricles, and must be totally independent of the action of the valves; in his last report the second sound is said to depend altogether on the action of the semilunar valves. He mentioned these circumstances merely to shew the difficulties which attended such observations. He believed that the question was not to be settled by experiments alone, but also by a careful attention to pathology, the best corrector of our observations.

At the time the last Dublin Committee was about being formed, (said Dr. Corrigan,) I was asked to become a member, but declined that honour, because I had entertained and published a theory on the points for investigation, and I did not wish that the Committee should be open to the charge of having among its members a person who had maintained peculiar views. The statements of that Committee must be therefore looked upon as perfectly unbiased. With respect to the cause of the impulse of the heart, although the experiments made by Dr. Hunt and myself were supported by those made by

Dr. W. Stokes, Dr. Hart, and M. Pigeaux, I have at present no hesitation in saying that on that point I was wrong, and I know the feelings of my audience too well, to think that my character is likely to suffer by such an avowal. Finding the result of experiments on warm-blooded animals unsatisfactory, I had recourse to observations on the heart of the frog, with the view of determining this point. In this animal the impulse of the heart is during the diastole, and the process can be very satisfactorily seen, as, owing to the transparent nature of its tissues, the dilatation of the ventricle is plainly seen by the change in its colour, produced by the rush of blood into it. I have prepared the animal, and have an opportunity of showing the heart in a state of perfect action. [Dr. Corrigan here exhibited the preparation. It showed very satisfactorily, that the whole body of the ventricle is raised and pushed forwards during the diastole.] With respect to the cause of the impulse, there was considerable difference between Dr. Williams and the Committee.

Dr. WILLIAMS. I stated that the impulse arose from the coming forward of the apex against the ribs.

Dr. CORRIGAN. The experiments of the Committee show that the body of the heart has as much to do with it. Besides, there is a direct experiment to show that the apex is very little concerned in producing the impulse. If you press your hands on the sides of the chest of a young ass, whose heart is remarkably conical and sharp at the apex, and the point of which hangs down towards the sternum, the impulse is felt strongly high up towards the shoulder and over a considerable space, where it could not possibly be produced by any action of the conical sharp-pointed apex. There was a mistake connected with the ordinary mode of making the experiment, which had been already pointed out by M. Pigeaux: the animal is generally placed on its back; the consequence of which is, that the heart lies back towards the spine, out of its natural position, and consequently has its anterior fibres stretched. Now, when the muscular fibres contract in this position of the organ, the first effect is to draw the apex back again to its natural position, and this gives the appearance of tilting. I do not believe that the apex is thrown forcibly against the side of the chest during the systole; I rather think that it is shortened and drawn towards the base; the appearance of tilting depends on the position of the animal. In Mr. Carlile's paper, an explanation of this tilting of the apex is given. It is stated there that as the fibres in front of the heart are longer than those on its posterior surface, the apex must be thrown forwards and upwards during the contraction of the ventricles. Suppose we reduce this statement to the test of numbers, and state the length of the fibres on the upper part of the heart to be twelve inches, and on the lower to be eight inches, and that each of these fibres during its contraction is shortened one-fourth of its length; it is plain, that in their contracted state, the length of the fibres on the anterior and posterior surfaces still continue to bear the same proportion to each other, as before,

and therefore, that the apex must move in the diagonal of the two forces, and can never be tilted beyond the line of either.

I come now to the sounds. I may observe here, that there is a great source of deception as connected with the point at which these sounds are heard. Among others is the curious one made by Dr. Elliotson, who says, that the second sound is from the auricles, because it is heard higher up than the ventricles. When you listen to the sounds of the heart in the natural state, you hear a peculiar sound which you call the first. You then open the heart and hear a sound, like this, but the question is, is it the first sound? In one of our experiments, to test Majendie's statements, where a layer of air was interposed between the heart and the ribs, no sound was heard: the finger was then placed between the heart and ribs so as to connect them, and the first sound was heard. Was this a sound produced by the stroke of the finger against the ribs, or was it the first sound? In the experiment detailed by the Committee, where the ventricles were filled with fluid and then compressed, was the sound heard a sound produced by the friction between the particles of blood in the ventricles, as first stated by Dr. Hope, or by the blood rushing over their rough surfaces, as stated by the Committee, or by the mere muscular contraction, as stated by Dr. Williams?

Dr. WILLIAMS stated, that Dr. Hope's opinion was, that the first sound was produced, in the first place, by the action of the auriculo-ventricular valves, next by the systole of the ventricle, and lastly by the *bruit musculaire*.

Dr. CORRIGAN said, that the first sound had been heard in the experiment in which the finger had been introduced into the ventricle.

Dr. WILLIAMS. Only part of the sound was heard, and this was the *bruit musculaire*.

Dr. CORRIGAN. I come now to the second sound. In the experiments made by Dr. Williams and the committee, this sound is attributed to the action of the semilunar valves. I have stated before, that I believed it to be owing to the sudden coming together of the surface of the ventricles at the end of their contraction, and gave some experiments in proof of it. It is said this cannot occur; but I think it has been proved by the experiments of Mr. Carlile. In the frog every particle of blood is expelled during the systole, and the sides come into close apposition; and if this occurs in a cold-blooded animal, it ought *a fortiori* occur in the warm-blooded. I think there is no direct experiment as yet to determine this question. The Committee state, that in the experiment where one of the valves is confined, a rushing sound is heard; Dr. Williams heard a hissing sound. Might not the second sound still exist, though masked by these sounds? If it be a physical sound, it ought to be produced by physical means. An experiment which I made some time back, goes, I think, to prove that the conclusions adopted on this point by the Committee require further investigation. Dr. Hunt and I, in our experiments, cut out from the heart of a donkey the ascending aorta

with its valves; we tied the aorta on the end of a leaden tube of a corresponding diameter, and about five feet long. About two or three inches of the aorta then being free of the lower extremity of the tube, in this state, holding the sides of the aorta together below, we filled the tube with water, and then placing the thumb on the upper end so as to close it, the fingers were withdrawn from the lower end, and the upper end still remaining closed, the external pressure of atmospheric air kept the two sides of the aorta below together, and no fluid escaped. The ear was then applied to the lower end of the tube, close to the aorta, and the thumb being suddenly withdrawn from above, the whole column of fluid came suddenly down, and distended the aorta and valves, and yet there was no sound whatever similar to the second produced. We attached to the end of the leaden tube, a piece of sounding board to assist the ear, and the result was the same as before.

Dr. Corrigan concluded by stating, that there were some points on which he agreed with the Committee, but with respect to the cause of the first and second sounds of the heart, he did not think their experiments conclusive.

Dr. CARSON, of Liverpool, thought that two sounds had been confounded in the experiments of the Committee; first, the sound produced by the blood, and secondly, that produced by the action of the heart on the parts round it. He thought that the first sound of the heart was produced by a collision between the particles of the blood, owing to air being mixed with it in the lungs, as proved by the experiments of Edwards on the respiratory function. If the blood were a homogeneous fluid, and of equal specific gravity, no sound of this kind would be produced. The second sound took place, in his opinion, during the diastole of the ventricles, and was caused by the sudden impression of the heart against the lung and surrounding parts, producing an impulse which is felt not over the left side alone, but over the whole thorax.

Dr. GREENE, on the part of the Committee, would beg leave to remark, in reply to Dr. Corrigan's supposition, "that in the case where the rushing sound was heard after the action of the semilunar valves was interrupted, this sound might have merely marked the second sound," that this could not be the case. By the second or rushing sound, the Committee meant the abnormal sound, as distinguished from the second sound, which required for its production the integrity of the semilunar valves.

Dr. EVORY KENNEDY thought, if a few points were explained clearly, they might tend to reconcile some of the differences between the Committee and Dr. Williams. One of the chief points of difference was, as to the cause of the first sound; this being attributed by Dr. Williams to muscular contraction, by the Committee to the rushing of blood over the rough surfaces of the ventricles. The Committee, however, did not deny that muscular contraction might have some share in producing this sound. Many good stethoscopists denied

that any sound was produced by muscular contraction. He did not go so far as this; but he thought that the sound thus produced was very indistinct, and quite inadequate to explain the phenomena in question. There was another point of agreement, to a certain extent, between Dr. Williams and the Committee, namely, the total cessation of the second sound on pressure being applied over the origins of the great arteries. This experiment had been repeated again and again by the Committee. The stethoscope was placed as near the origins of the vessels as possible, and the members of the Committee shut their eyes while applying the ear to the stethoscope. This mode of examination, however, had not proved satisfactory, owing to that tumultuous struggle in the heart, when there is an impediment offered to the passage of the blood. He would wish to know how Dr. Williams managed this experiment, as it was one in which the Committee experienced great difficulties. As to Dr. Williams' illustration of the sound of muscular contraction by means of a handkerchief, he did not think it could be applied to explain the action of the muscular fibres of the heart. In the case of the handkerchief, the vibration was produced by a thin substance, and in a different medium. With regard to the impulse of the heart being the cause of the first sound, he denied it altogether, though he was willing to confess that it might increase it. In the heart of the new-born infant, it is communicated over the whole chest, and he had sometimes heard the pulsations of that organ as low as the buttock of the child. With reference to Dr. Corrigan's observation, that no inference could be drawn from the projection of the apex of the heart, because the subject of the experiment had been laid on its back, he would merely state, that when the heart was removed from the body, the same phenomenon was observed.

Mr. HARGRAVE observed, that it was now almost generally admitted, that a certain degree of bruit accompanied muscular action. The difference between this, as observed in strong and weak individuals, was very remarkable. It was very probable that its intensity in the case of the heart, was connected with the peculiar structure of that organ, which was more dense, firm, high coloured, and having a smaller proportion of cellular tissue, than ordinary muscles. He thought that the experiment of Dr. Williams, in which the heart was removed from the body, and made to act on the finger without permitting any blood to enter it, was conclusive on this point, as in that case, the limit had been heard distinctly. But it had been asked, why does not the heart produce this sound when laid open? He believed it was because the integrity of the organ was diminished.—He was inclined to think that a certain degree of bruit accompanied the dilatation of the ventricles also, and thought that the dilatation of these cavities was by no means purely passive.

Dr. CORRIGAN differed from the last speaker. Pathology contradicted the supposition of active dilatation. In narrowing of the auriculo-ventricular opening, the ventricle should become hypertrophied, (according to the well known law, that muscular fibres are hyper-

trophied in proportion to the obstruction to be overcome), if the supposition were true.

Mr. CARLILE observed, that in such cases as the one just mentioned, the muscular sides of the auricles are found to be hypertrophied, shewing that the active cause of the passage of the blood, into the ventricles, exists in the auricles; and further stated, that neither from the structure of the ventricles nor from analogy, was it reasonable to suppose an active dilating power in the ventricles.

Dr. WILLIAMS would trespass for a few moments on the attention of the meeting. Dr. Corrigan had made a mistake in confounding his experiments with those of Dr. Hope. He had nothing to do with Dr. Hope's statements or explanations. With respect to the impulse of the heart, he did not deny that, occasionally, other parts of that organ may be concerned in it, as well as the apex; but in the natural condition, he thought it was produced by the apex; first, because from the anatomical disposition of the fibres, that part must be thrown more forwards and upwards than the rest of the heart, and in the next place, because it is less completely covered by the lung. His observations merely applied to the heart acting normally; for in the pathological condition, the case was different. With reference to the observations made as to the difference of sounds, depending upon distance and upon position, he would observe, that the appearance of distance, noticed in the sounds of the heart, as differing from those conveyed along dense and metallic substances, depended on the peculiarity of its structure. In the heart we have muscular fibres which do not convey the vibrations like metallic substances, and hence the dissimilarity. He would say, once for all, that experiments would always be liable to error, unless the experimenters were intimately acquainted with all the physical laws of sound. One word with regard to the position of Dr. Corrigan, that the ventricles came completely together and expelled all their blood. This position he denied. He thought that in warm-blooded animals the blood of the ventricles was never completely expelled. In them the muscular fibres of the heart are too thick and strong to be capable of collapsing and coming together completely. With respect to another point alluded to by Dr. Corrigan, namely, as to whether the murmur heard when the semilunar valves were fixed was so loud as to conceal the second sound; the term he made use of was the bellows' sound, but he begged leave to state that this was by no means such as to prevent the second sound from being heard had it existed. With respect to Dr. Corrigan's experiment, of a column of water being allowed to fall upon the semilunar valves of the aorta without producing any sound, he thought there was no parallel between it and the results of vital action. It can be looked upon only as a negative experiment.

In reply to Dr. Kennedy's objections, as to muscular action being the cause of sound, he would say a few words. This subject was not as yet sufficiently investigated. In answer to the objection that the rapid contraction of the biceps in the forearm produces scarcely any sound, he would reply, that the cause of this was, that

it chokes itself, and the vibrations destroy each other. Various sonorous impulses, commencing simultaneously, may obstruct and destroy each other, as has been lately proved by Sir J. Herschell. With reference to the difference of sound supposed to be connected with difference of medium, he would state that this sound may be produced under water as well as out of it. As to the subject of pressure applied over the great arteries, he would observe, that when it was slight, a whizzing sound accompanied the first sound, the second being still audible but faint; but when considerable pressure was made, the second sound was uniformly obliterated. In conclusion, he would remark, that the explanation given by him of the cause of the first sound differed very little from that given by the Committee. He believed, however, that the essential cause of this sound was seated in the muscular fibre, and that other circumstances contributed to it, inasmuch as they had a tendency to make the action of the muscular fibres more abrupt and complete.

Dr. ALISON observed, that there was a remarkable coincidence between the results of many of the experiments made here and in London. Both parties were very nearly agreed as to the motions and the cause of the second sound, and even with respect to the first, they were partially agreed, as they had acknowledged the agency of the same cause in its production. He concluded by moving the thanks of the meeting to Dr. Williams.

Dr. HARRISON, in seconding the motion, said, as a member of the Committee, he felt pleasure in observing these coincidences. As the discussion, however, had run so far, he would suggest its postponement for the present; it might be resumed the next day after the reading of Dr. M'Donnell's paper on the pulse. There were only two papers more to be read, which would not require any observation.

Dr. Alison's motion was then put from the Chair, and carried unanimously.

Mr. HART read a letter from the Edinburgh Committee appointed to inquire into the motions and sounds of the heart, regretting that they would not be able to furnish their Report until the next meeting of the Association.

Dr. ALISON read a Report on the registration of deaths in Scotland.

The Report commenced by stating the importance of having a proper registration of deaths, both in a statistical and medical point of view, and that at the recommendation of the medical section in Edinburgh last year, a committee had been appointed, consisting of two divisions, one resident in Edinburgh, the other in London, with power to associate with them some Dublin physicians. The Report contained a lucid and able exposé of the plans pursued by the committee to insure accuracy in the registration, and obviate the numerous sources of fallacy to which the ordinary modes were liable.

The meeting then adjourned.

THIRD DAY.

Wednesday, August 12th.

Dr. PRICHARD in the Chair.

Mr. HART having read the report of yesterday's proceedings, stated that the first communication to be laid before the meeting was from Dr. M'Donnell of Belfast, on the action of the heart and pulse.

Mr. CARLILE wished to know whether the discussion which was broken off yesterday would be allowed to proceed. The reason he put the question was, that he had refrained from answering Dr. Corrigan and others, on the understanding that there would be an opportunity of replying to their objections to-day.

Dr. HARRISON said he could confirm the statement of Mr. Carlile, that there had been an understanding of that kind. It was but right, however, to observe, that business had accumulated very much, and that the meetings of the section must necessarily terminate on Friday. It was the object of the Association to collect important facts and obtain valuable matter rather than to have long discussions, however interesting they might be. At the same time, he believed it was generally understood that Mr. Carlile, who had a hand in framing the Report on the motions and sounds of the heart, and who did not say any thing yesterday, had a fair claim to be heard.

Dr. M'DONNELL observed that his paper had been handed in at an early period of the proceedings, and that he wished to read it without delay.

Dr. M'Donnell would crave the indulgence of the meeting, while he referred briefly to a few passages in his former paper, of which the one he was about to read might be considered the appendix. As the former had been already laid before the Medical Section of the British Association, at Edinburgh, he would abridge very considerably what he intended to communicate on the present occasion. He began by describing what he calls the *differential pulse*, and gave proofs of his claim to priority in such observations, having commenced as early as 1784. He finds that in lying, sitting, or standing there are three distinct numbers in the pulse, any one of which being given, the rest may be discovered by inference. This variation amounts generally to twelve, fourteen, or sixteen beats per minute, as its normal state, and therefore, that all observations of the number of the pulse, which have been made without reference to this principle, must be considered as nugatory, unless it be implied that the person was in the *horizontal position* when the observation was made. This rule for reducing the number of the pulse to a regular standard applies to health, but not precisely to disease; the effects of posture must be investigated separately in each disease.

The *differential pulse* appears to be confined to man. It is not observed in brutes, probably because, from their form, their posture may be considered as always horizontal; but when placed erect this peculiarity appears also in them.

The variation, in the human species, is at its maximum in tall and feeble subjects, particularly in convalescents from typhus; the minimum is generally found in children. These facts lead to the supposition, that this phenomenon is connected with some hydrostatic law, and not depending entirely on vitality. This, however, is merely thrown out as a conjecture, and requires further investigation. But in whatever manner it may be considered, it is plain that in all attempts to ascertain the effects of remedies, as well as of natural causes, due allowance must be made for these fixed differences produced by posture. What avails it to say that a medicine, or venesection, or heat, or cold, or a thousand other natural causes, raise or depress the pulse by four, six, or eight beats per minute, when the mere change of posture would raise or depress it twelve, fourteen, or sixteen per minute, and this merely in health, for in disease the differential pulse is often double this proportion.

In tracing the connexion between the pulse and respiration in man and quadrupeds, he finds that it ranges in health from four to six pulses for one respiration. This he considers a new and material fact; for if it be established by further observation, that this is a general law, we shall be able to infer the pulse from the respiration, and *vice versa*. This may be of advantage in enabling us to ascertain the number of the pulse in ferocious animals which we dare not touch, as well as in man during action or progression.

There is a coincidence between the number of pulses and steps in walking, at the common rate of progression in man, that is very remarkable and has not been hitherto noticed. His breathings are also singularly proportioned to his steps, so that it is easy to deduce these numbers from each other. But in hard labour or violent muscular exertion, as in running or ascending heights, the proportions are greatly altered. The same thing occurs in many forms of disease. There is reason to believe, that the carbonization of the respiration air, has a great influence in all those cases where the number of respirations is greatly disturbed.

Dr. M'Donnell finds that the number of respirations, and by inference the number of pulses, are much the same in passing over the same space, whether we run or walk, i. e. they depend as much upon the space traversed as on the time. Thus he finds, if he walks 1000 yards in ten minutes or in eight, or runs over it in five minutes, the number of breathings are nearly the same. It is to be observed, however, that this rule does not apply to small portions of space, such as fifty or 100 yards. These facts, he thinks, are all complicated with carbonization and muscular motion, so as to require separate investigations.

In quadrupeds, especially when trotting or cantering, he has found, that the steps, divided by the respirations, never give any fraction in the quotient, i. e. that these are universally proportional without any deviation. In man this does not occur, a circumstance which may arise from some peculiar anatomical or physical law in the connexion between the respiratory and muscular construction of these animals.

Dr. M'Donnell next referred to three errors observable in a work on consumption, published by Dr. Sanders, in 1808, first as to his claim to priority in noticing the differential pulse, secondly as to his explanation of its cause; and thirdly, as to his idea that the amount of the differential pulse is always directly proportioned to the natural or standard velocity of the pulse. It is true, when we rise erect from the horizontal position, a greater number of muscles are brought into action, but this has nothing to do with the phenomenon in question. He had proved this by placing different persons in an apparatus, so constructed that the body could be placed in all postures without any muscular motion, and he found that the differential pulse followed all the angles of elevation exactly, and this even in persons when asleep. But when the body is inverted, with the head lowered and the feet raised, this rule does not hold good. This part of the subject he proposes to follow at a future opportunity.

PART II.

Dr. M'Donnell next referred to exceptions to the doctrine of the differential pulse made by his friend Mr. Travers Blackley of Dublin. He had himself met with persons apparently in health in whom there was little or no differential pulse, but from some recent observations he is inclined to think that some of these exceptions may have arisen from disease of the heart or great arteries. He had certainly found the maximum of the differential pulse in aneurisms of the descending aorta, in three or four cases of which the pulse doubled on rising erect. Nevertheless it was fair to acknowledge that Mr. T. Blackley had found the most permanent or stationary pulses in cases of organic lesion of the heart. These facts, though apparently contradictory, may both be true, and may tend to establish a just explanation when they are more numerous and more perfectly understood.

The greater number of these observations occurred to Dr. M'Donnell, before he became acquainted with the writings of Laennec. Although Laennec's discoveries have given a new turn to the subject, and created a more lively interest about the sounds of the heart, yet it gives a greater value to the foregoing facts as far as they are substantiated. One thing invariably occurred, that, in proportion as the pulse was accelerated or retarded, by change of posture, its strength and fulness were affected in an inverse ratio. He thought that an attention to this circumstance might probably assist in forming a more just measure of the strength and fulness of the pulse than any hitherto known, but put this forwards merely as a conjecture.

While engaged in these inquiries about thirty years since, he had found that the pulse in the arteries of the foetus, before it breathed, was *slower* than in those of the mother. He had found also, that if the child, when born, remained for some time without breathing, the pulse continued slow during that interval, and became accelerated only at the instant it took in its first breath. This fact appearing to him new, he had investigated the circumstance in the cow, and find-

ing the phenomena similar, he had communicated his observations to Dr. Clarke, Dr. Labatt, Dr. Stokes, and Dr. Douglas in Dublin, none of whom had ever noticed it in any author. Dr. Jefferay mentioned it in his lectures, and in his "Observations on the Heart and on the Peculiarities of the Foetus," and thought it might hold true of quadrupeds, and perhaps of all warm-blooded animals. He thought it probable that the foetus before respiration was in the condition of a cold-blooded animal, and partook of that slowness of the pulse which characterizes the tribe. There is in the present state of our knowledge great difficulty in reconciling the slow pulse in the arteries of the foetus with the rapidity of the sounds as heard by the stethoscope. How are we to reconcile such contradictory facts, as that 150 strokes or more should be heard by the stethoscope, while the pulse of the child is only 50 or 60? Supposing both these points established by observation, he would submit the following hypothesis in explanation, viz. that although there are but two sounds of the heart heard for every pulsation of an artery in the adult, it does not follow that the same ratio should exist in the foetus. While the foramen ovale remains open and in the full performance of its office, it is plain that the two auricles cannot contract simultaneously; because in that case the blood could not be freely transmitted, the one driving it forward, the other backward at the same instant. Therefore, until nature closes that aperture, the right auricle must contract first, and the left immediately afterwards, while the ventricles will contract in unison as they do in the adult. Hence it happens, (if this hypothesis be true,) that instead of having two sounds of the heart for every arterial pulse, we shall have three or four.

I am aware, that it has been asserted, that neither of the sounds of the heart are produced by the auricles; but it does not follow that if this be true of the adult, that it should be true of the foetus, whose circulation is different. Besides, it has not been asserted by any one, that the pulse of the foetus is slow or quick, but merely that the sounds of the heart are more numerous than in the adult. This matter, however, must be decided by future investigations.

It may appear surprising, how the sounds of the foetal heart can be transmitted through the liquor amnii, and through the parietes of the uterus and abdomen in the mother, so as to become distinctly audible; but the following simple experiment will serve to explain it. Suspend a watch in a vessel containing many gallons of water, and on applying your ear to any part of the circumference of the vessel, you will hear the beats more distinctly than in the air. The same thing occurs when several folds of cloth are passed round the vessel. Dr. M'Donnell thought this was an argument in favour of the possibility of hearing the sounds of the auricles in the foetal heart, though they could not be heard in that of the adult.

When the pulse is felt in the funis of a new born child, its strength and fulness appears to be equal to that of the larger arteries in the adult? Whence arises this impulse? While the ductus arteriosus is still open, the blood of both ventricles is driven at one

stroke into the descending aorta; whereas in the adult, the blood passing through the descending aorta, merely receives the impulse of the left ventricle. Before respiration takes place, the vessels of the cord pulsate with great force, but as soon as the child breathes, they shrink rapidly and become pale and flat. Now all this occurs when you raise the foetus and the cord above the level of the placenta. This happens whether the placenta be attached or not, whether the cord pulsates or not, and finally, after the arteries have been tied leaving the vein free.

Dr. M'Donnell concluded his paper with an account of several experiments made in descending twenty-six feet in a diving-bell; the result being that no change whatsoever was observed in the number of the pulse or breathing under all the variable degrees of pressure; but that the carbonization upon every volume of the expired air decreased and increased accordingly as he descended or ascended. Hence he infers that man and all such animals can live, if supplied with pure air, under all degrees of increased pressure, and also at all heights, until the quantity of oxygen in the atmosphere becomes incapable of decarbonating their blood.

Dr. CARSON said he felt great pleasure in listening to the communication of Dr. M'Donnell. He thought that portion of it particularly important in which it had been determined by experiments that the circulation of the foetus was slower than that of the adult. In fishes, which are immersed in a fluid of the same specific gravity, the circulation is also remarkable slow.

Dr. COLLINS said, that from the experiments he had made on the subject, he had come to quite a different conclusion. He had invariably found the circulation of the foetus much quicker than that of the mother.

Mr. CARLILE.—I beg leave to state, that the observations I am about to make, do not refer to the subject of Dr. M'Donnell's communication, but to some points connected with the motions and sounds of the heart. Allow me, Sir, to express the gratification I feel at observing the remarkable coincidence between the experiments of Dr. Williams, and those performed by the Dublin Committee. Between Dr. Williams and the Committee, the only essential difference is as to the cause of the first sound, and this is a difference which has reference, not to the fact, but to its explanation. The Committee have concluded, that there is considerable difficulty in ascertaining exactly the cause of the first sound, because it has been found by experiment, that by the application of various external agents to the ventricles, and in the absence of the blood, a sound resembling the first sound has been heard. We, therefore, came to the conclusion, that probably two causes operated in the formation of this sound. The chief cause we look upon at present to be the rapid motion of the blood rushing over the rough surfaces of the ventricles. When it is considered that the current of blood in an artery on whose internal surface an excrescence exists, is capable of producing a distinct sound, there is every reason to infer, that when the blood rushes

over the rough surfaces of the ventricles, it must produce vibrations and collisions capable of being heard. The *bruit musculaire* is to me, I confess, a matter of doubt; I have never satisfied myself of its existence. Some members of the Committee are of a different opinion, and if it exist, perhaps it may have some share in the production of the first sound. Dr. Williams states, that when the ventricular systole commences, there is a sudden lightening in the walls of the ventricle; and to this he attributes the phenomenon in question. Now I will venture to say, that any one who listens carefully and attentively, will find the first sound similar in its character from the commencement to the termination of the systole. It begins and ends with the ventricular systole, and is uniform throughout; the lightening of the walls of the ventricles is an instantaneous action, and therefore I should be disposed to reject the idea, that any tension of the ventricular walls can contribute to its formation; but I beg leave to remark here, that I am aware of the great difficulties with which the investigation is surrounded.

I come now to Dr. Corrigan's observations. He states that in his opinion the impulse is formed by the diastole, and not by the systole of the ventricles. In the Report of the Committee it is stated that the impulse is produced by the forward motion of the apex and body of the ventricle, during the systole. Dr. Corrigan objected to the circumstance of the apex concurring in its production, and stated in reference to an explanation of the forward motion of the apex, which I had given in a paper published in the transactions of this Association, that any person acquainted with the properties of numbers and figures would conclude that that explanation was incorrect. Now I say that any person acquainted with the properties of lines and angles would come to a different conclusion. It is a law of muscular action, that the fibres of muscles contract in proportion to their length, and therefore, the diminution of their length, when contracted, bears a constant ratio to their length in the uncontracted state. The length of the fibres on the anterior and posterior surface of the heart varies in different individuals; but always in the human subject, and in the higher classes of animals, the length on the front far surpasses that of those on the posterior surface. This diagram gives a representation of the relative lengths of the fibres, on the anterior and posterior aspect of the human heart; and this one, the relation of the corresponding fibres, in the heart of simpler structure, in which those lengths are equal, or nearly so. [Here Mr. Carlile exhibited two diagrams.] In the human heart, the fibres by whose contraction the apex is drawn towards the base, are longer on the front than on the posterior surface, consequently, during the systole of the ventricles, the apex approaches the base, not in the axis of the cone, but in a curve which is anterior to that axis: if the fibres on the front and back are equal, then when the heart contracts, the apex will move towards the base in the axis of the cone; but if the fibres on the front are longer, the apex will be drawn forwards and upwards. [Mr. Carlile then exhibited two other diagrams, representing the human heart, and that of simpler formation, in the contracted state.] Dr.

Corrigan differs from the Committee with regard to the first and second sounds. He states that the first sound is caused by the rush of blood into the ventricles, during the auricular systole; the second sound by the ventricular systole. It is interesting to trace the manner in which he arrives at these conclusions. In physiology, as in morals, the first false step often leads to others. Dr. Corrigan's first false step was, the supposition that the systole of the ventricle is synchronous with the pulse in all the arteries, a fact which has been disproved by mathematical reasoning and by experiments. He was quite too acute not to perceive that the beat of the heart is not synchronous with, but precedes, the pulse in the distant arteries. The first sound, however, was found to coincide with the beat of the heart, and therefore it became necessary (as, by the supposition alluded to, the systole of the ventricles was excluded from the formation of that sound) to look among the motions of the ventricles, for some one which might fulfil the problem of the first sound, namely, which might precede the systole, and appear capable of producing a sound, and this motion was necessarily diastole. The systole had been excluded by this process of reasoning, and the diastole was inferred.—The first sound, then, was supposed to be connected with the dilatation of the ventricles, during the systole of the auricles, and the impulse was supposed to be produced by the projection of the body of the ventricle against the walls of the thorax, while in that state. With respect to the second sound, it was also necessary to find some explanation, and this Dr. Corrigan found in the ventricular systole, and by the following process: the diastole is followed by the systole; the second sound follows the first sound; the first sound is caused by the diastole; therefore the second is caused by the systole. But the first sound is long, and the auricular systole is short, the second sound is short, and the ventricular systole is long. Here then, Dr. Corrigan, after the manner of Procrustes, who also was an experimental anatomist, adapted the lengths of his subjects to the necessities of the case; he lengthened or shortened them according to the measure of his Procrustean bed; he stretched to the length of the long, first sound, the naturally short ventricular diastole, and shortened to the measure of the short second sound, the naturally long systole of the ventricles.

I come now to examine his conclusions as to the cause of the second sound. He states that it arises from a sudden coming together of the walls of the ventricles immediately after their systole. This conclusion is open to numerous objections. First, it assumes that the ventricles empty themselves completely of their blood. Of this I have strong doubts; and I concur in this opinion with Dr. Williams. I have come to this conclusion, because I think that the cavities of the heart in the higher order of animals empty themselves less completely than in the lower; to this opinion I have been led by observations during experiments, and from a consideration of the structure of the heart in different classes of animals. The specific functions of these parts are performed more completely in the lower than in the higher animals. In the latter I do not think that the

ventricles are ever completely emptied in any instance. I have never found the dead heart completely empty, except in one case of *tetanus*; in this case the heart was twisted in a very remarkable manner from the contraction of its fibres, and the left ventricle was found empty.

I dismiss this subject, however, as one of minor importance. The nature of the contact between the sides of the ventricles remains to be examined. Dr. Corrigan has made experiments to prove this, and I confess that I was surprised that Dr. C. should have made such an experiment, and still more that he should have relied upon it. The dead heart was selected for the purpose; a syringe was adapted to one of the great arteries, the ventricle was filled with water, and the piston of the syringe being retracted, a sound resembling the second sound was heard. Now it is easy to conceive that when the two surfaces of the dead ventricle came "smack" together, a sound somewhat like the second sound might be produced. But contrast the circumstances of this experiment with the action of the living heart, which it was intended to illustrate. There the parts come together by a lengthened and graduated action; before the surfaces can touch, the cavity must have been gradually obliterated; and instead of a sudden slap between the parietes, we have merely a forcible closing or pressure. I appeal to any one of ordinary perceptions and common understanding, whether the abrupt, clear, decisive "second" sound could be produced by a cause manifestly so inadequate. But there is still another objection which is fatal to Dr. C.'s conclusions. He says, that the second sound occurs at the termination of the ventricular systole. Any person who makes the experiment of placing the ear-tube over one of the great arteries, and places his hand upon the ventricles while beating, will find that the second sound is not heard until after the ventricular systole is completed, and that it coincides with the beginning of the diastole. Dr. Corrigan yesterday admitted that the beat of the heart is caused by the ventricular systole, with which the first sound is synchronous; consequently, in his view, both the first and second sounds are caused by the ventricular systole; now to say that an unvarying cause can, in the circumstances of the case, produce two such different effects, is at least unphilosophical. Dr. C. objects to one of our experiments, that the second sound is probably drowned by the whizzing or rushing sound, noticed as occurring at the same time, supposing that the rushing sound was the louder of the two. I would invert this position and say, that the second sound, as heard previously to the confining of the valves, is louder than the rushing sound which was heard after that operation. Besides, we could hear both sounds together, as is detailed in one of our experiments, and did not find it at all difficult to discriminate between them.

There is an experiment which I omitted to mention before, and which I should wish any one, who doubts the forward motions of the ventricles and the apex during the systole, to repeat. Take out the heart of an animal quickly, and while it is still beating, suspend it in

water by a line; precisely the same motions will occur in the ventricles while suspended in the fluid as while beating in the body of the animal. With respect to some observations of Dr. Carson, that the presence of air in contact with the blood is necessary to the formation of sound;—I believe in the healthy state air is never found in the heart. In an experiment which I made some time back of injecting a quantity of air into the jugular vein of a horse, as soon as the air reached the heart a violent struggle of that organ took place: the convulsive movements of the right auricle forcibly, and in jets, expelled the blood from the vein; the animal became greatly distressed, and died in a few minutes. The heart, immediately taken out of the body, was found to be insensible to stimulation: the violence of its action had been such as to destroy its vitality, and it could contract no longer. I think here the heart died first and the animal afterwards.

Mr. CARLILE was proceeding to refute the opinion of Dr. Carson with respect to the tendency to the formation of a vacuum in the chest, as connected with the circulation of the blood, when,

Dr. COLLINS rose and stated that the discussion was becoming too protracted, as very many papers of importance were to be read before the section.

Mr. CARLILE then stated to the President, that he was just about to conclude, and would merely refer to the circulation in the cases of artificial respiration in the foetus, in some reptiles, and in fishes, as confirming his opinions.

Dr. CORRIGAN said, that he thought it would be an unnecessary waste of time to make any reply at present, as some of the Committee were of opinion that the subject was not as yet settled, and required further observations and experiments.

Dr. HARRISON and Dr. GRAVES assented to this, and the section passed on to the next paper.

Dr. HARRISON read a communication on certain bones found in the hearts of some of the ruminantia.

Dr. HARRISON said, that in consequence of the numerous references which had been already made to the structure and functions of the heart, he should compress within as small a compass as possible, the observations which he intended to lay before the meeting. The circulation of the blood through the system, in the higher orders of animals, exhibited a series of mechanical provisions, admirably adapted to secure that harmonious order indispensable for the well-being of the economy. Although the due activity of the circulating organs must depend mainly on the integrity of the nervous and vital powers, yet many steps in this interesting process are purely mechanical. A review of the various organs engaged in that function unfolds a series of curious mechanical provisions, varying *ad infinitum*; all having a common type, and bearing the impress of one common hand; and so wonderfully contrived in every part, that the most extraordinary ingenuity could not make in them a single improvement.

In the form and structure of the heart the greatest diversity prevails. Thus, in fishes where the circulation is single, we find the heart small in proportion to the bulk of the animal, and its valvular apparatus very imperfect. In reptiles, where there is an approximation to the double circulation of the higher animals, the heart is increased in size, and its parts proportionably well developed. In birds the apparatus is still more complex. The heart is large, we have valves at the orifice of the pulmonary, and the left auriculo-ventricular opening is furnished with a sphincter muscle. In the right auriculo-ventricular opening there is also a sphincter muscle, and a portion of the muscular mass of the heart projects, so as to form a kind of valve. In the amphibia and cetacea, the circulation presents some very remarkable peculiarities; but he would not dwell on this point, as the subject had been already touched on in Dr. Houston's paper, on the peculiarities in the circulating organs of diving animals.

He did not intend to give any particular account of the circulating apparatus in the four higher divisions of the animal kingdom; although a review of their circulating organs would prove highly interesting, and serve to illustrate by comparison the uses of the various additional provisions for carrying on that function, and how each addition to this complicated machinery serves some important purpose. He would confine himself at present to some peculiarities of structure in the hearts of certain ruminantia. These peculiarities have been but lightly touched on by writers on comparative anatomy. Cuvier scarcely alludes to them; they are mentioned but in a very general way by Carus and Meckel, and the notices of them given by Haller, Morgagni, and others, are extremely imperfect. The structures to which he referred were situated close to the roots of the aorta, and consisted of two bones, sometimes more; two, however, were essential, the additional ones being only occasionally present. The first bone was large, and of an irregular form, somewhat resembling the malar bone in shape. It lies deep in the anterior part of the septum of the auricle, and cannot be seen without some dissection. One of its margins is concave, and gives attachment to the anterior division of the mitral valve; the other edges have an irregular outline, and give connection to muscular fibres of the auricle. The second bone is smaller; it is placed on the posterior surface of the heart, close to the roots of the aorta, and can be seen by a little dissection. It contributes, like the former, to strengthen the floor of the semilunar valves, and give attachment to muscular fibres.

[Here Dr. Harrison gave a minute description of the anatomical relations of these bones.]

Dr. Harrison stated that he had not found these bones so distinct in any other animals. There is no vestige of them in the horse or dog. In the aorta of a very old horse, which he exhibited to the meeting, there was a small cartilaginous body, which he was inclined to look upon as a rudiment of the larger bone, but this was the only approach to the structure in question, which he had witnessed in that animal. He noticed the remarkable difference between the heart of

the ox and horse; in the former the parietes of the heart being extremely thick, strong, and fleshy, and the cavities small, whereas in the horse, the cavities were proportionably large, and the ventricular walls thin. There were some other animals in which a somewhat similar structure was observable. In the stag, the rudiment of the anterior bone existed, but not of the posterior. Of all animals, the best specimens of these bones were to be found in the ox. It has been stated (said Dr. Harrison) by some, that they are not to be found in the young animal, but this is a mistake; here is the heart of a calf three weeks old, and you can perceive how rapidly the development of these bones is going on. Here is a cartilaginous mass in the situation of the larger bone, and you can see a nucleus of bone in the centre of it very plainly. This shews clearly that those ossific deposits are not, as Carus thinks, accidental, but are the result of a natural process.

From the uniformity of the size and structure of these bones, and from the numerous dissections I have made, I am led to consider that they serve the following purposes. The heart of the ox is very peculiar in its structure; its cavities are very small, its muscular parietes very thick, and of enormous power. Now, the muscular structure, if examined, will be found to stop short at the tendinous insertions of the aorta, and, consequently, it leaves that portion of the vessel which corresponds to the semilunar valves in a weak and unprotected state. I conceive, therefore, that one of the purposes which these bones serve, is to strengthen the roots of the great vessels in these situations, and defend the opening of the aorta from the effects of violent contraction. In the second place, this bone (the larger one) affords a degree of protection to the auricle, which has a larger cavity, but is not so strong as the ventricle; and in addition to this, affords a fixed point for the contraction of the muscular fibres during the auricular systole. It may also serve to prevent that cavity from being completely closed. Thirdly, it gives strength and attachment to the mitral valve, which is fixed to its upper border. Again, when we consider the size and calibre of the aorta in the ox, and the extraordinary thickness and elasticity of its parietes, we shall readily see the necessity of having some provision to support the pressure caused by the returning columns of blood. Accordingly, when we examine the aortic sinuses we find, that of two of them, the floors are formed by these bones, in addition to the ordinary structure. The third sinus of the aorta, which is deprived of this protection, is defended by a peculiar provision, consisting of a remarkable fatty deposit of a hard and firm nature, and which is found in the youngest animals, even in those which are very lean. The sinuses of the pulmonary artery are also defended by this fatty substance; in fact, it appears to be their principal protection, for when dissected off, the walls appear so weak, as to be scarcely capable of bearing the impetus of the returning blood. The semilunar valves in the calf and ox are also very beautiful, and the corpora Aurantii highly developed, so as to afford good grounds to think, that they are intended chiefly for the support of the valves along their free margin.

Dr. HARRISON concluded by exhibiting some very beautiful preparations of the bones already described. He had made many dissections of these bones, and would feel happy in exhibiting them to any gentleman who was anxious for further information. As there was a great deal of interesting matter to be laid before the meeting, he had condensed his observations as much as possible, and would trespass no longer on the attention of the meeting.

DR. HART then announced that DR. HOUSTON would read a paper on certain hydatids found in the omentum of the Axis Deer.

As this interesting paper derives great importance from a series of beautiful drawings, illustrative of the facts which it advances, we deem it advisable to reserve it for our next number, in order to be able to publish, at the same time, the drawings, of which the author has given us permission to make copies. The paper contains a description of several hydatids, but more especially the *cysticercus tenuicollis*, of which a great number, of large size, were found in the omentum of an axis deer, which died in the Zoological Gardens, at Dublin. The principal object of the paper is to determine the pathological changes, which hydatids and other parasitical animals undergo, and their relation to malignant or tubercular diseases. The degeneration of hydatids through all their changes is described, and the phenomena of degeneration are traced by DR. Houston to a different source and termination, from that supposed by other authors to belong to them. The following extract from the paper, will give some idea of DR. Houston's views on the subject. "With respect to the question, whether the disease in the cyst proceeds and becomes the cause of death in the hydatid, or that the animal, after passing into the state of death, and thence acting as a source of irritation on the investing membrane, gives rise to those changes in that texture, which have been just described, it is very probable that the latter view of the case is the correct one: viz. that the worm having arrived at a certain age dies; that it then comes to act as a foreign body; and that all the subsequent changes which take place in the cyst are merely the consequences which flow therefrom. The numerous and singular differences in the condition of the hydatid tumours, from that state in which they exist as translucent and living bodies, to that in which they appear in the form of small bone-like particles, would seem to indicate, that a long period had elapsed since the development of the first series of hydatids in the omentum, and that these having passed away, were succeeded by others, which, in their turn, gave place to ternary and quaternary formations, each equally subject to decay, and running by the same processes into the same ultimate states of degeneration. In fact, the animals might be said to have established, in the omentum, a sort of colony—propagating their young, passing through 'les quatre âges de la vie,' and finally converting their habitations into sepulchres, where their bodies passed into complete decay, without farther damage to the surrounding parts. There is most probably with these, as with all animated beings, a limit to the term of their existence; a period beyond which they are fated not to retain the condition of vitality."

The full report of this paper, together with the accompanying plates, shall appear in our next number.

Mr. CARMICHAEL rose, and was about to make some pathological observations on hydatids, when he was interrupted; the understanding of the meeting being, according to a suggestion of Dr. Montgomery, that all discussions should be postponed until the papers appointed by the Committee to be read, had been laid before the meeting. This regulation, however, not referring to the communication of any new facts tending to elucidate the subjects under consideration,

Dr. HARRISON wished to direct the attention of the meeting to a peculiar species of entozoa, occasionally found in the voluntary muscles of the human subject. Here is an enlarged view (said Dr. Harrison) of the biceps of a human subject, and you may perceive that the body of the muscle is dotted all over with oval white specks. When examined with a microscope, these specks are found to consist of a semitransparent cyst of an elliptic form, in the interior of which a minute worm lies coiled up into spires. These specks are more distinct a few days after death than in the recent subject, in consequence of the cysts becoming more opaque. The worms have been frequently examined after being removed from the cysts, and have been found to move for several hours after the death of the individual. They are of a pyriform shape, when taken out, and seem to have a kind of transverse opening at their larger extremity. I do not exactly know to what particular class of entozoa they are to be referred; the general opinion seems to be, that they belong to a new class, of which the genus is not ascertained; but this is a matter which seems to require farther investigation. I have never found them in any of the involuntary muscles: a few have been met with in the semi-involuntary, particularly along the margins of the diaphragm, and in the sphincter ani; but they are chiefly observed in the voluntary muscles, especially those of the loins and back. Out of six specimens examined, I have not been able to detect any of them in the heart or the muscular tunics of the intestines. They occur in the limbs, but less frequently than in the back and loins; I have seen a greater number of them in the latter situation than in any other. In the liver of the same subject, from which this drawing of the biceps was taken, I found a large cyst containing hydatids; and I mention this fact, as shewing the same disposition in the individual to the formation of *viventia intra viventia*. I have in addition to state, that I have never observed these entozoa except in emaciated individuals of an apparently scrofulous habit. In three of the six persons examined, there was tubercular disease of the lungs, in the rest there were manifest signs of previous scrofulous ulceration. Dr. Harrison said he mentioned these facts, in connexion with what had been stated by Dr. Houston. He had not examined that state of the muscles in the hog, to which the name of measles was popularly given, but thought it probable, that this state

might depend on a cause somewhat analogous, namely the development of entozoa.

Mr. CRAMPTON (who had taken the chair in place of Dr. Prichard) said, that any gentlemen having facts illustrative of the subject of Dr. Harrison's paper, was at liberty to state them to the meeting.

Dr. ROE of Cavan said, that he was called some time back to visit the daughter of a farmer residing at Drem, in the county Cavan; the girl had been attacked several days previously with inflammation of the thigh, and at the time of his arrival was labouring under severe symptomatic fever with delirium. The thigh was tense, red, and shining, enlarged to nearly twice its natural size, and extremely painful. No cause could be assigned for the disease, and he was informed, that until the occurrence of the present attack, she had always enjoyed excellent health. Having ascertained the existence of a collection of matter under the fascia, he made an incision, and evacuated a bowl-full of pus, mixed with what he considered to be clots of blood. His attention was not directed to the contents of the abscess at that time, besides the room was dark, and he was anxious to give vent to the pus as quickly as possible, as the patient was extremely restless. On emptying the matter from the bowl on a clean flag outside the door, the girl's mother was surprised to find among it a leech coiled up, quite alive and moving actively. She immediately brought the leech to me and it continued to live for several days afterwards. On inquiring minutely into the history of the case, I found that some days before she first complained of the limb she had been gathering water-creases in a ditch and had felt hurt in or about the ankle of the inflamed limb, but did not pay much attention to it at the time. On examining the ankle I found a triangular cicatrix such as that which might be produced by a leech bite. This fact would seem to prove that such animals can enter, burrow in, and preserve their vitality in the soft parts of the human body.

A member asked whether Dr. Roe meant to state that the leech had entered in the manner supposed?

Dr. Roe stated that he did not know any other way in which it could enter. The animal in question was what is called the horse-leech, and which is generally found in ditches and standing pools.

The chairman stated, that some time since several of the deer at the phoenix park had manifested symptoms of delirium, in consequence of which it was found necessary to shoot them. On opening six of these animals, he had found the trachea in every case filled with worms. The mucous membrane was so thickly covered with them, and they lay so closely together, that at first sight it would be difficult to recognise them; but when the trachea was placed in water, they became loose, and could be easily distinguished. They were pendulous in the trachea, and attached by the head, which bore some resemblance to that of a leech. Several of these worms continued to live for more than three minutes after being detached from their nidus.

In answer to a question from a member, Mr. Crampton said, that the deer were quite delirious, and ran wildly about the park, knocking their heads against the trees. He had examined the brain, but had not been able to find any thing in it to explain the symptoms.

Mr. DICK stated that he had recently discovered a small worm attached to the mucous coat of the intestines in the horse, of which he would be happy to exhibit a specimen to any gentleman desirous of seeing it. It was about three-eighths of an inch in length, and lay with its tail coiled up, in the mucus of the intestine, forming a small protuberance about the size of a mustard seed.

Dr. JACOB mentioned a very interesting fact which he had lately ascertained. He had, at the suggestion of Dr. Marsh, (who supplied him with a number of fowl for the purpose,) dissected a great many chickens labouring under the disease termed "pip," and had discovered that it was owing to the presence of worms in the trachea.

Dr. CORRIGAN said, that he had found in the lung of a rabbit a worm of the same kind as that noticed by Mr. Crampton in the trachea of the deer.

Dr. HOUSTON remarked, that the occurrence of these parasitic animals, even in great numbers, should not lead to the conclusion, that they had been the cause of death, as many persons were inclined to think. He had been frequently surprised to find the vast quantities of worms which are to be met with in animals at all periods of their existence, without producing any remarkable inconvenience.

A member detailed a case of ovarian dropsey, in which the fluid had been evacuated on three successive occasions. At the first operation the fluid evacuated was semipurulent, at the second gelatinous, and at the third it consisted of water mixed with hydatids.

Dr. JACOB would trespass for a few minutes on the attention of the meeting, while he examined some statements put forward by M. St. Hilaire, in a paper containing an account of the mammary glands in the cetacea. The object of M. St. Hilaire seemed to be to prove that the mammary glands in these animals are peculiarly circumstanced, and that the process of sucking in the young of the cetacea differs from that of the other mammalia. These circumstances are the position of the gland between the belly and the subcutaneous muscles, by which it is said to be subjected to pressure; and the existence of a reservoir for the milk running the whole length of the organ. Dr. Jacob argued, that the existence of a subcutaneous muscle did not prove that it was capable of pressing out the fluid contained in the gland, or that this pressure might occur only when the young animal was applied to the mamma. As to the reservoir, the only peculiarity in it consisted in its being formed of a single cavity; and the existence of such a provision was necessary, when the posture of the animal and the situation of the nipple were taken into consideration. Another of M. St. Hilaire's assumptions was, that the young of the cetacea could not suck under water. Into this point it was unnecessary to enter, as it had been already disproved by Dr. Traill. Dr. Jacob here described the process of sucking, and proved that during that

act, respiration is carried on freely and calmly. He said that one of the most curious circumstances connected with the matter under consideration was, the apparent ignorance of the uses of the soft palate manifested by M. St. Hilaire. Dr. J. looked on the soft palate as a most important organ, discharging the office of a perfect valve, and capable of completely closing up the posterior openings of the mouth or nares, as occasion required. He concluded by showing some interesting experiments to illustrate the use of the soft palate in respiration, sucking, &c. Dr. Jacob exhibited several preparations and drawings of the mamma in cetaceous and other mammalia.

Dr. COLLINS read a series of tables, kept during his seven years residence in the Lying-in Hospital, Rutland-square. These tables, with a detailed account of the practice of the hospital during his mastership, are at present in the press and will be shortly published.

Dr. ALISON moved the thanks of the meeting to Dr. Collins, for the extraordinary labour and care which he had displayed in keeping these tables. Dr. Greene seconded the motion, and it passed unanimously.

A communication from Sir James Murray was then read, containing some observations on the effects produced in various forms of disease, by lessening or increasing atmospheric pressure. Owing to the lateness of the hour, it has been found impossible to notice this communication at length. It may be observed, however, that the principal points developed in it may be found in the London Medical and Surgical Journal, and in the Lancet for March, 1835.

Dr. HART announced, that the Committee were to meet at three o'clock, and that he should, therefore, move the adjournment of the Section.

FOURTH DAY.

Thursday, August 13th.

Dr. PRICHARD in the Chair.

Mr. CARMICHAEL made some observations (in reference to Dr. Houston's paper of Wednesday) as to the independent vitality of parasitic productions.

Dr. HOUSTON felt gratified by the attention which his communication had excited, but would not enter further into the subject, as it was one which did not admit of being settled by *ex tempore* discussion.

Dr. HART read a report from Dr. Roupel, on the effects of poisons on the animal system.

Dr. ROUPEL commences by stating, that his colleague, Dr. Hodgkin, had already laid before the medical section at Edinburgh, a report of the effects of irritants; the object of his paper was, to shew the effects produced by poisons introduced into the circulating system, and the affinity they appear to exercise for the component elements

of different parts of the body. Several plates were exhibited, illustrating the results.

Plate 1st represented the stomach and intestinal canal of a dog, poisoned by arsenic. An ounce of the saturated solution of arsenic, made by boiling arsenious acid, and allowing it to cool, was injected into the femoral vein of a dog. In three minutes afterwards, the animal became sick, and made an attempt to vomit; his breathing also became very much hurried. In ten minutes more, great intestinal movements appeared to be going on, and the abdominal muscles were forcibly contracted; in twenty-five, vomiting took place, followed by paralysis of the hind legs; in thirty-five, the animal died. The body, when examined shortly afterwards, was found rigid, the blood fluid, the lungs stuffed with mucus, but not inflamed. The peritoneum was rough, and had lost its shining appearance; the stomach presented the hour-glass contraction, and was found to contain an ounce of tough mucus. The great end was much inflamed, the lesser differed very little from its healthy state. The large intestine was free from disease, and contained solid faecal matter. The chief alteration was in the small intestine, which was extensively inflamed, and covered with a layer of tough mucus, tinged with blood. There was no change in the mucous membrane of the trachea, or bronchi; or in the lining of the heart, veins, or arteries. The chief points of interest, connected with this experiment, are the absence of inflammation in those parts, with which the poison came in contact, and the circumstance of its being restricted, almost exclusively, to the intestinal canal.

Plate 2nd represented the stomach of another dog, poisoned in the same way. The subject of this experiment was a strong animal, and the solution of arsenic which was employed had been filtered. The same quantity, however, was administered as in the former case, and the poison was injected into the femoral vein. Shortly after the operation, vomiting took place; in twelve minutes solid faeces were passed from the bowels, followed by tenesmus. In thirty-five minutes, vomiting, cramps, and dysenteric symptoms occurred, which continued with more or less severity, and in about two hours the animal died. The lungs were injected, but not inflamed. The stomach and intestines were universally inflamed; the former contained about four ounces of frothy mucus, the latter, throughout its entire length, a bloody secretion. The mucous membranes of the rest of the body, were redder than natural, but no change could be detected in the lining membrane of the venous or arterial systems. In this instance, the longer interval between the injection of the poison and the death of the animal gave time for a greater extension of inflammation.

Several experiments were made with smaller quantities of the arsenical solution, but without any fatal result. Half an ounce, thrown into the femoral vein of a strong dog, appeared to produce but little inconvenience. Half an ounce of the liquor hydrargyri oxymuriatis, was injected into the veins without producing any appreciable result. An ounce (which contains half a grain of the

corrosive sublimate) produced dysentery and considerable distress, but not death.

The next trials were made with tartar emetic; the preparation employed was the vinum antimonialis. An ounce of this was thrown into the saphena vein of an active terrier. The first and almost immediate effect of this was to produce symptoms resembling intoxication, a circumstance which may be attributed to the quantity of alcohol contained in the preparation employed. The animal was able to stand and run, but reeled about and tottered in its gait. On being visited some hours afterwards, it was found dead; from the appearance of its jaws, vomiting seemed to have taken place. The brain was found natural in appearance, and the intestinal canal presented nothing different from the normal state; the chief alteration appeared to have occurred in the stomach, which exhibited signs of intense vascularity, particularly at its greater end.

Several other experiments were made but of less interest; when a solution of a metal in strong acid was employed for the purposes of injection, death took place rapidly, and the mucous membrane presented a marked red appearance. Dr. Roupel had been able to satisfy himself, as to how far such changes in the intestinal canal are to be attributed to the compound, or to the effect of the simple acid, which in itself would coagulate the blood, or greatly predispose to that condition. The injection of a solution of creosote, a substance which appears to possess the greatest power in this way, has no influence on the intestinal canal. A drachm of this substance, mixed with water, produces no effect; but when injected pure, death has been the result. The appearances seen on dissection in this case, were confined to the lungs, which were black and gorged with blood that appeared to consist of minute granules, mixed with a fluid of inky blackness.

Dr. Roupel concludes, that any attempts at explaining the effects of the foregoing experiments, must, in the present state of animal chemistry, be merely conjectural. How far poisonous substances prove irritant by their chemical agency, or by exciting in certain parts the peculiar susceptibility to inflammatory action, it is not easy to determine, but it must be admitted, that something more than mere contact is required in those cases, where irritants applied to the surface, or thrown into the veins, provoke inflammation of the intestinal canal. Whether it be, that the system is on its guard against those substances which tend to increase the coagulation of blood, must be made a matter for future investigation; but certain it is, that substances endowed with this property, seem to have a great tendency to excite the inflammatory condition. It is a curious fact also, as connected with this point, that the coagulation of the blood becomes diminished under such circumstances, or in other words, that coagulation goes on more slowly in an inflamed state of the blood.

Dr. HART concluded by moving the thanks of the Section to Dr. Roupel for his interesting Report.

Dr. GRANVILLE, of London, spoke in very high terms of the

care and ability manifested by Dr. Roupel, in drawing up his Report; he thought the thanks of the meeting were justly due to Dr. Roupel, and that a specific motion should be made to that effect.

The motion was seconded by Sir A. Crichton, and passed unanimously.

Dr. ALISON next proceeded to read a communication on the vital properties of arteries leading to inflamed parts.

Dr. ALISON said he had been for some time past occupied in endeavouring to form an estimate of the physiological principle of spontaneity of movement in animal bodies; in other words, of the movements which occur in these bodies, independent of their living solids. He considered it important to come to a decision on this point, for if this principle exists, its alteration, where it can be effected, must make a fundamental change in the circumstances of many diseases. If it exists, it is very probable that it is connected with the functions of the capillary system; a system, which is at present acknowledged as having a very remarkable connexion with the phenomena of diseased action in general.

Two branches of this inquiry are particularly deserving of attention. 1st. Whether the phenomena of inflammation can be explained on the supposition that the only vital principle is the action of the heart and vessels. 2ndly. If the movements of the blood through the lung can be explained on this principle. Dr. Alison thought these questions must be answered in the negative.

The first series of experiments made by Dr. Alison went to prove that the vital power of tonic contraction (to which Dr. Parry has given the name of tonicity, and which determines the degree of contraction in arteries after death) becomes diminished in arteries going to inflamed parts. Dr. Alison here detailed an hydraulic experiment which was made on axillary arteries of a horse, the one leading to sound, the other to inflamed parts, by means of two tubes furnished with stop-cocks; the rise of the water in one of the tubes being the measure of the distention of the artery. By these it was found that the reaction of a sound artery raised the level of the fluid sixteen lines, while that of the diseased artery raised it only ten lines; thus proving that the sound artery was capable of greater distention than the diseased. As this experiment might be objected to, as being performed ten hours after the animal's death, the axillary arteries of another horse were experimented on half an hour after the animal died. The subject of the experiment had laboured under violent inflammation of the knee joint, for which blood had been copiously extracted. On measuring the arteries of the diseased and sound limb, those of the latter were found much larger. The diseased arteries were also found to become enlarged as they approached the inflamed part. A portion of artery which was examined, measured $\frac{7}{8}$ ths of an inch at its upper or smaller extremity, and $\frac{1}{2}$ ths at its lower. In this experiment the artery of the sound limb expelled $1\frac{1}{4}$ inches of water, while the artery of the inflamed limb expelled only $1\frac{1}{4}$. In another experiment made by Dr. Spittal, the greater dilating power of the sound artery was also

observed; the difference between the contracted and dilated state of the sound artery being $\frac{1}{4}$ ths, of the diseased artery $\frac{6}{7}$ ths.

From these experiments, it results, that the arteries leading to inflamed parts become relaxed and weakened, transmitting the impressions given by the heart with less modification, and having less power of contracting on the blood. This being established, the question is, whether this state of the arteries is an adequate cause for the phenomena of inflammation, that is, whether inflammation consists in this condition of the vessels? He thought this question required further investigation. Two changes occurred in all cases of inflammation, a retarded movement of the blood in the vessels of the part, and an increased movement in the surrounding vessels. If we suppose that inflammation consists in an altered action of the vessels of the inflamed part, we make no attempt to explain the difference between inflammation and simple congestion. This subject requires a vast number of experiments for its elucidation.

The next part of Dr. Alison's paper contained some notices on the cause of death in cases of asphyxia. He commenced by stating that it was well known that the admission of air into the lungs was absolutely necessary for the prolongation of life; that when air was excluded, the power of the heart became inadequate to the transmission of the blood, which, under such circumstances, could no longer pass through the lungs. The question then was, in what manner respiration exercised this auxiliary power? He referred to the doctrines of Haller, Bichat, Goodwin, and others, and stated that the theories of the two latter being found erroneous, the doctrine of Haller had been again revived. The best mode of bringing this doctrine to the test was, to shew what occurs in an animal breathing a gas which contains no oxygen; where the mechanical change is going on, but the chemical is suspended. He, therefore, thought, that by confining an animal in azote until its breathing became laboured, and then taking it out and killing it immediately, he might have an opportunity of ascertaining whether the blood passes through the lungs, as in a case where the chemical change is going on. A rabbit having been confined in azote, was taken out, and its sensibility destroyed instantaneously by a blow on the head. It never appeared to inspire after the blow was struck, but was slightly convulsed. On opening the chest, Dr. Alison was surprized to find that the contractions of the heart were extremely feeble. The right side of the heart was distended with blood, and the quantity of blood, procured by puncturing the pulmonary artery, was ten times as much as could be got from the left side of the heart. In the right side of the heart there was a faint pulsation, which continued for a short time; the left side appeared to be quite motionless. From this experiment, it would appear, that if oxygen is not inspired, and if the chemical change in the blood is suspended, obstruction to the circulation through the lung takes place and asphyxia results, although at the same time the mechanical action of the organ may continue. In what way then are we to suppose that the inspired

air acts on the circulation? If we suppose it to act as a stimulus on the capillaries of the lung, the theory is open to objection, inasmuch as it has not been proved that these vessels are capable of contraction. On the other hand, we cannot suppose that the air acts on the vessels of the lung as a sedative. The only conclusion we can come to, in the present state of our knowledge, is, that atmospheric air, applied to the blood in the lungs, promotes its passage through these organs in a manner wholly inexplicable. The motion of the blood through the lungs appears to be determined by a cause independent of any impulse from the containing solids. This view of the question appears to be borne out by what is observed in vegetables and the lower tribes of animals, in which the fluids move without any contraction on the part of their containing solids, and seems to be confirmed by the vibratory motions of the ciliæ, as observed by Purkinje, motions which Dr. A. seems inclined to attribute to spontaneous currents in the fluid itself.

Dr. ALISON, in reply to a question from Dr. Granville, stated that the sound artery contracts more and dilates more than the diseased.

Dr. GRANVILLE remarked, that the experiments did not mention whether the portions of sound and diseased artery experimented on were equal in point of capacity, and contained the same quantity of fluid?

Dr. ALISON said, the diseased artery was a little larger than the sound one, and of course would take in a little more water. The length of the two portions experimented on was the same; there was some slight difference in their calibre.

Dr. CLENDINNING, of London, was anxious to know what arrangements had been made for the further prosecution of the investigations on the motions and sounds of the heart?

Dr. HARRISON said this did not depend on the medical Committee. All they could do was to recommend the matter to the consideration of the general Committee.

Dr. GRAVES. The general Committee will decide on this point next Saturday. The Committee in Edinburgh are still pursuing their investigations on the subject, and intend to furnish a Report at the next meeting of the Association. It was the intention of the medical Committee to recommend to the general Committee, that another Committee should be appointed, or that the gentlemen already nominated should be requested to continue their labours for another year, so that two Reports on this interesting subject might be laid before the section at the next general meeting.

Dr. CLENDINNING. The greater the number of minds brought to bear on this subject, the more likely are we to arrive at the truth. I would beg leave to suggest that additions be made to each of the existing Committees.

The next paper was from Mr. Whatton of Manchester, on partial amputation of the foot.

Mr. WHATTON said, that as far back as 1811, during the Peninsular war, his attention had been drawn to this subject. At that

time, when the bones and soft parts of the foot were injured by balls or fragments of shells, the usual practice was to amputate transversely, either at the tarso-metatarsal union, or higher up at the astragalo-scapoid and calcaneo-cuboideal. Since he had been appointed to the infirmary at Manchester, he adopted a different mode of operating, which was attended with very superior advantages. He had adopted this plan after a careful study of the relative anatomy of the foot, and was not aware that there was any such operation on record. He tried the operation in a great number of cases, and found it to answer extremely well; of this he hoped he should be able to convince the meeting, as he had an opportunity of showing a patient on whom the operation had been performed, and who was able to walk twenty miles a day.

Mr. Whatton then took a review of the history of partial amputations of the foot from the time of Garengeot down to the present day. The operation of removing a part of the foot had been practised by many before him. The operation then fell into disuse, and continued so until 1789, when it was taken up with some modifications by Chopart, and afterwards further modified by Dupuytren and Richerand. In 1814 this operation became generally known in London, by the publication of M. Roux's work. A method of partial amputation of the foot had been proposed in England as early as 1758, by Mr. Sharp, a similar one by B. Bell, at Edinburgh, in 1778, and the subject had been also noticed by Mr. Hey of Leeds. In 1815 Lisfranc revived Garengeot's operation. To all these different modes of operating one common objection holds, the arch of the foot is destroyed, the patient has no support except what he derives from the heel, and the limb is in fact very little better than a wooden leg. Where the flap is taken from the sole, there is a constant risk of sloughing; and the division of the plantar vessels frequently leaves the flap without a sufficient supply of blood to maintain its vitality. The power of the muscles of the calf is constantly drawing the os calcis upwards and backwards; while the antagonism of the muscles is destroyed by the division of the extensor tendons. In the operation which he (Mr. W.) was about to propose, all these inconveniences were avoided; the spring of the foot is preserved, and if the patient be provided with a proper shoe, scarcely any deformity can be observed.

To illustrate this operation, Mr. Whatton read the details of the two following cases.—The subject of the first case, a man about thirty years of age, was admitted at the Manchester Infirmary, on the 25th of November, 1833. Twelve years before, he had got a swelling of the foot, which was followed by necrosis of the internal and external metatarsal bones. Several fistulous ulcers had formed on the dorsum of the foot, and a probe, introduced into one of these, passed under the integuments, to the extent of four inches, upwards and downwards. He had quick pulse, emaciation, night sweats, and hectic.

Finding that all ordinary modes of treatment had proved ineffectual, Mr. Whatton decided on the longitudinal operation, which was

performed in the following manner. An incision, commencing at the root of the fourth toe, was carried, in a slightly curved direction, towards the extremity of the fifth metatarsal bone, and terminated near the outer malleolus. This incision was made on the plantar surface of the foot. A similar incision, commencing and terminating at the same points, was carried along the dorsum. The flaps being dissected off, the knife was carried between the two outer metatarsal bones, down to the cuboid. The outer edge of the os calcis, being found diseased, was also pared off with the scalpel. The second incision removed the next toe and its metatarsal bone in a similar manner, leaving three toes with their corresponding tarsal bones. There was considerable haemorrhage after the operation, and it was thought advisable to defer dressing the foot, until the patient was placed in bed. The wounds healed kindly, and the man was discharged about twelve weeks after the operation, perfectly well. A cast of the foot was taken ten months after the operation; this shews some fulness about the integuments of the tarsus and metatarsus, but in a cast taken twenty months after the operation, a manifest improvement is visible.

Mr. Whatton here exhibited the casts, which he stated he should feel great pleasure in presenting to the Royal College of Surgeons of Dublin. The patient operated on was exhibited to the meeting.—He walked up and down, with as much ease as a person who had the perfect use of his limbs; and on being required to stand on the leg, singly, he made the attempt in such a manner as to shew that he possessed a considerable power of balancing himself. Much approbation was manifested by the meeting on the occasion.

The next case was that of a female, who had two fungous ulcers of the dorsum of the foot, attended with caries of the heads and shafts of two of the cuneiform bones. There was a constant discharge of fetid, ill-conditioned pus; the patient got no sleep, and suffered very much from pain of the foot. The first incision commenced at the scaphoid bone, and was continued down to the root of the second toe. The second incision, commencing at the same point, ran along the edge of the second metatarsal bone, including the whole of the diseased part. The knife was next passed between the second and third toes, and the metatarsal bones being pressed down, the ligaments were divided. The scaphoid bone, being found diseased, was also removed. The haemorrhage was easily restrained, and only two ligatures were necessary. The wound healed tolerably well, and the woman was made an out-patient, about two months after the operation.

Mr. Whatton stated, that it was his intention to follow up the subject, and bring it again before the section. He observed that an accurate knowledge of the anatomy of the foot was essential for the proper performance of the operation. He submitted his communication with diffidence, and threw himself upon the kindness of the meeting.

Dr. GRANVILLE said, that the operation so ably detailed by

Mr. Whatton, indicated a new era in surgery. Assembled as the meeting was, to promote the interests of science, it was their duty to take into consideration the immense advantages which this admirable operation possessed. He was certain that an operation of this kind would have preserved many efficient members of the army and navy, whom the transverse operation or amputation of the leg had rendered useless burthens to the country.

Mr. CARMICHAEL looked upon the operation as exceedingly valuable. In Chopart's operation, the limb was very little better than a wooden leg; this left the patient the full power of using it.

Dr. JACOB, of Maryborough, wished to know whether there was any difference of result between the case in which the inner part of the foot alone was removed, and the case in which the outer portion had been amputated. The reason he asked the question was, that having removed three of the fingers, in a case where the hand had been lacerated by machinery, (leaving the thumb and index finger,) he had found that the circulation in the remaining portion became extremely languid, so much so, that it required a great deal of care to prevent the tendency to gangrene which the parts exhibited.

Mr. WHATTON observed, that he had not seen such a tendency in the cases which he had operated on. The second case was going on well, and he had no doubt of the ultimate recovery of the patient.

Professor JEFFRAYS, of Glasgow, detailed an operation of a similar kind, performed by Mr. Park, of Liverpool, in which the tarsal bones were removed.

Mr. WHATTON said, that the removal of the tarsal bones was not the same operation.

The thanks of the meeting were then voted unanimously to Mr. Whatton.

A paper was read by Dr. William Stokes, on the diagnosis of some diseases of the thorax, in which there is an accumulation of the products of disease within that cavity.

Dr. STOKES stated, that he had already in two communications, published in the Dublin Medical Journal, pointed out some of those important signs which result from the effects of a distending force on the thoracic parietes, and had shewn that the diagnosis of empyema depends in a great measure on this circumstance.

Without entering on the question, as to whether organic diseases of the thoracic viscera are followed in all cases by some alteration in the volume of these organs, we may divide cases of thoracic disease into two classes; first, those in which there is no manifest alteration; and secondly, those in which there is a manifest alteration of volume. This division, however, is merely arbitrary. These enlargements are of two kinds; either an actual increase of volume of the parenchyma of the lungs, or a distention of its serous covering. The affections in which these occur, may be termed diseases of accumulation. Another, and more important division, is that founded on the effect of disease, in increasing or diminishing the quantity of

air within the thorax. If we take empyema on the one hand, and dilatation of the air cells and pneumothorax on the other, we find that these diseases of accumulation may occur with a diminution or an increase in the quantity of contained air, so that the diagnosis depends, first, on the evidence of accumulation, and next on the physical properties of the accumulated matter. In empyema, there is accumulation and pressure from a non-elastic fluid; in emphysema and pneumothorax, from an elastic medium. In empyema we have, in addition to signs of displacement, proofs of a diminution in the quantity of contained air; in the other affections, we have also displacement, but the quantity of air is increased.

There are, however, some very interesting points of difference, connected with the results of these diseases on the walls of the thorax. In empyema, the dilatation is most remarkable in the inferior portion of the lung; in emphysema, in the superior. A still more remarkable difference appears to be connected with the effect of these two diseases on the muscular parietes of the chest. In empyema, the muscular parietes of the chest yield, in a very obvious manner, to the effects of the disease; the intercostal spaces are obliterated, the affected side enlarged, and the diaphragm depressed. But in emphysema, the disease may be carried to a great amount, without producing these appearances. Now what is the cause of these remarkable differences? To explain this, was the object of the present communication.

It would appear that the explanation of the dilated state of the intercostal muscles was to be sought for in the circumstances attendant on pleuritic inflammation. It is a well established fact, that when muscular structures are in close connexion with inflamed tissues, their functions become impaired; and in such cases we observe, first an increase, and afterwards a diminution of innervation. In the first place, we have pain, spasm, and irritation; in the second, weakness and paralysis more or less complete. Under the latter condition, the muscular fibres lose their contractility. Dr. Stokes here referred to the researches of Dr. Abercrombie on Ileus, in which the morbid appearances were found to be confined to the dilated and not to the contracted parts. With respect to the evidences in favour of the opinion, that the displacement of the thoracic muscles was the result of paralysis, he stated, that in the first stage of pleuritis we have pain on inspiration, without protrusion of the intercostal spaces; but in the more advanced periods, pain is absent and respiration more free, but the intercostal spaces yield, and we have smoothness of the side produced. The latter circumstances corresponds with the minus degree of innervation, or paralysis. The next evidence is, that mere pressure is not sufficient to produce this. If we examine emphysema or hydrothorax, we shall find that in both there is strong pressure exercised on the muscular parietes of the thorax, as shown by the enlargement of the chest; yet the intercostal spaces are not necessarily dilated. The last point of evidence is the sudden yielding of the diaphragm, which Dr. Stokes

had observed in certain cases of empyema. This yielding was as extensive as it was sudden, and was not accompanied by evidences of increase of effusion. He thought, therefore, that he was borne out in the conclusion, that the protrusion of the intercostal spaces and the depression of the diaphragm are the result of a semi-paralysed state of these organs.

This principle (if established by future investigations) might be applied to the investigation of other forms of thoracic disease. Of pleuritis he had already spoken ; it would be necessary to make a few observations with respect to bronchitis and pericarditis. In all these the suffering of the muscular tissue in the first stage has been recognised, but the effects of inflammation in the advanced condition had been neglected. In bronchitis it is a question how far the paralysis of the circular fibres of the bronchial tubes, may account for the accumulation in those tubes which is so commonly followed by asphyxia, in cases of bad catarrhal fever. In such cases we often see the patients dying from the effects of the accumulation in the lung, although there is no remarkable general prostration, and the individuals possess a considerable degree of muscular strength, so far as the system of animal life is concerned. Again, it might be inquired, how far, in dilatation of the bronchial tubes, this condition may have existed. All writers seem to have acknowledged that Laennec's explanation of this occurrence is imperfect and unsatisfactory. Lastly, in cases of pericarditis, this principle (if admitted) would serve to explain the fatal termination of the disease. How accurately do the symptoms of the advanced stage of pericarditis, the syncope, the weakness, the failure of the pulse, correspond with a more or less paralysed condition of the heart ? How singularly do the phenomena of the first stage correspond with the increase of innervation which we knew to be the first effect of inflammation of the muscular structure ? The same principle would serve to explain the supervention of active aneurism on the advanced stages of pericarditis. In the weakened state of the heart it yields to the pressure of the blood, and by degrees its cavities become distended. On the hydrostatic principle the force of this distention must be every moment increasing, and, of course, the progress of the disease will be proportionally rapid. Now, suppose that the inflammatory process ceases ; the muscular fibres of the heart recover their tone, but they have an increased duty to perform ; and from the well-known law in physiology their growth is increased. To dilatation is added hypertrophy, and thus active aneurism is established. This theory differed from that of Andral, who assumes that the hypertrophy takes place from the first, and omits the possibility of an intervening paralytic condition of the heart.

The last point to which Dr. Stokes referred, related to the phenomena of respiration in Laennec's emphysema. If we take two cases of disease of accumulation, as for instance empyema and dilatation of the air cells, and suppose that in one the chest yields *pari passu* with the enlargement of the lung, while in the other it is rigid

and unyielding; it is plain that the physical conditions and signs must be different. This appears to afford an explanation of the feebleness of respiration in dilatation of the air cells. If the quantity of air in the lung be so great as to keep it forcibly distended even after expiration, it is obvious that on the next inspiratory effort, the volume of air which enters will be minus the expansion of the lung from its distending force. If this be true, and this cause be the principal source of the feebleness of respiration, it should follow, that if the chest yielded easily to the enlargement of the lung, the disease would occur without the characteristic sign; in other words, the feebleness of respiration would be more a measure of the compression of the lung than a direct sign of Laennec's emphysema. Dr. Stokes brought forward an illustrative case, and concluded by stating, that these observations and suggestions should be tested by future investigation.

The next paper laid before the Section was by Dr. Evory Kennedy, on the treatment of purulent ophthalmia in new born infants.

Dr. KENNEDY said that he wished it to be understood by the meeting, that the object of his communication was merely to illustrate some disputed points in practice; on such a subject nothing new or original was to be expected. Purulent ophthalmia was of very frequent occurrence; many cases of it were to be met with in lying-in-hospitals; it was a disease of a violent character, and perhaps caused more blindness than any other affection of the eye. He did not intend to enter into the history of the disease, nor would he stop to examine the question as to its phlegmonous or erysipelatous nature. A great deal of difficulty attended the investigation of the origin of purulent ophthalmia, as connected with a specific virus. As far as his experience went, the proportion of cases which could be distinctly referred to gonorrhœa, or to the leucorrhœal discharge, was very small. He had, however, observed that ophthalmia, generated in this way, was of a bad and obstinate character; five of the worst cases he had seen had been produced by infection, and in one of these there was extensive sloughing of the cornea. The disease was observed in the lying-in hospital to commence either immediately after birth, or in a few days afterwards. It was also seen to follow exposure to cold and irritants, a circumstance which goes to prove, that irritation, whether specific or not, may produce it. Viewed without reference to any theory, the disease seemed to consist in a violent and rapid inflammation, speedily followed by a copious secretion from the diseased part. A very remarkable change took place in the secretion of the conjunctiva; this, however, was not peculiar to that membrane; an analogous change was frequently observed in certain affections of the mucous membrane of the genito-urinary and respiratory systems.

With respect to the treatment of purulent ophthalmia in children much difference prevailed. Some treated it with sedatives, others with stimulants; a third class restricted the use of sedatives to the early stage of the disease, and then had recourse to stimulants and

astringents. He would proceed to state those means which he had found most efficient. One of the first and most necessary steps in the treatment was the application of leeches. One of these was applied to the inflamed lid, or to the temple in the immediate vicinity of the eye ; the former situation was, however, generally preferred. Dr. Kennedy had never seen any inconvenient or alarming haemorrhage from the use of leeches under such circumstances, and conceived that the extravasation of blood in the loose cellular tissue of the lids might, by its pressure, have some effect in preventing the haemorrhage. In bad cases, where the inflammatory symptoms ran high with copious purulent discharge, and a tendency to eversion of the lids, the leech was applied a second or even a third time, or oftener. Leeching was not found necessary in all cases ; in the milder ones, fomentations, alterative aperients, and the use of a solution of nitrate of silver, removed the disease in two or three days. With respect to leeching, he had to observe that he had never seen any of the bad effects attributed to it by some practitioners ;—in some of the cases which he had under treatment, a leech had been applied four, five, or even six times to the same individual with benefit.

After leeching, the common practice is to have recourse to fomentations, aperients, and astringent collyria. Dr. Kennedy did not think this a mode sufficient ; to treat the disease with effect, it was necessary to produce an altered action in the diseased parts.—For this purpose nitrate of silver seems to be better adapted than any other substance ; he had tried it extensively, and could bear ample testimony to its value. He had always employed a strong solution, having found that under five grains to the ounce, it produces little or no effect. Solutions, varying in strength from ten to twenty grains, or even half a drachm to the ounce, were applied to the eye, three or four times a day, and succeeded in effecting a cure, where weaker ones had failed. In some cases, the solid nitrate of silver was applied all over the inside of the lids. This was followed by considerable pain, and a puffing of the lids, which continued some hours after the operation, but was easily removed by sponging the eyes with cold water. In obstinate cases, besides leeching and the nitrate of silver, alterative aperients were employed. Scarification of the lids was not resorted to in any case, and Dr. Kennedy thinks, that in the early stage it is objectionable. A close and constant attention to cleanliness was found to be of the greatest use, and he had observed that those nurses, who were careless in washing the eyes of the children after birth, had the greatest number of cases in their wards. The foregoing treatment proved ineffectual, where attention to cleanliness had been neglected. His attention was drawn to this circumstance by observing, that all the cases which were under one particular nurse recovered rapidly, and cases which had been going on badly with others, began to improve when placed under her care. On inquiring into the cause of this, he found that this woman kept the child almost constantly in her lap, and removed the discharge with a soft sponge, as fast as it formed. This was also noticed in

the convalescent cases. Where the children had been removed from the hospital, a slight discharge still continuing, they generally relapsed from neglect. The case of sloughing of the cornea was one of this description.

The success attending this practice was seen in the rapid subsidence of the disease. On the second or third day, the infant was able to open its eyes, and the worst cases yielded in ten days. Where the disease was protracted, owing to local or constitutional debility, the muriated tincture of iron was given in the breast milk, and occasionally the vinum opii was dropped into the eye.

Dr. BEATTY said, that having the superintendance of a similar institution, he could confirm many of the foregoing statements.—With respect to a specific virus, he had observed, that in the great majority of cases he had been unable to trace the disease to such a source. With regard to treatment, his experience differed in some points from Dr. Kennedy's, particularly as regarded the application of leeches. He had been desirous of testing the merits of treatment, omitting the use of leeches, and had found that a recovery took place as certainly in those cases where no leeches had been used as where they had been employed. In about twenty-five or thirty cases which had occurred at the lying-in hospital, in Cumberland-street, he had not used a single leech, and yet in no case had the disease terminated in blindness, nor was it ever found necessary to keep the child in hospital longer than ten days. Its treatment consisted at first in the use of cold applications to the eye, constantly repeated, and the use of alterative aperients, and afterwards of the saturated solution of the subacetate of lead, as recommended by Dr. Jacob. If no improvement followed the use of the liquor plumbi, in two or three days, he then had recourse to the solution of nitrate of silver, of the strength of ten grains to the ounce or more. He had found the five grain solution quite inefficient.

Mr. BYRNE said, that in every case of purulent ophthalmia, which came under his notice, he had been able to trace it to infection. He had frequently applied the solid nitrate of silver to the conjunctiva, with great benefit; any swelling of the lids, arising from its application, could be removed easily by a poultice, made with bread soaked in cold water.

Dr. COLLINS stated, that he had been in the habit of applying a leech to the eye-lid in case of purulent ophthalmia, and repeating it in six or eight hours afterwards if necessary. He seldom found more than two necessary to arrest the disease, and had recourse to the nitrate of silver on few occasions; but where he had used it he found it very serviceable. He had never observed any bad effects from the use of leeches.

Dr. IRELAND said, with reference to the doctrine of a specific virus, that he had frequently met with the disease in cases where there could not be the slightest suspicion of the existence of gonorrhœa. As a proof that purulent ophthalmia may be caused by common irritants, he would mention that in a case which he had recently

attended, the disease was produced by the nurse permitting a drop of proof spirit (which had been used in washing the child) to fall into the eye. With respect to leeches, he had used them on very many occasions, and had never observed any bad consequences to result from their application. He was in the habit of applying the leech to the conjunctiva lining the lower lid. After having reduced the inflammation by leeching he used the nitrate of silver solution in the proportion of a scruple to the ounce of distilled water, and would have no hesitation in using it of the strength of a drachm to the ounce, or even more. With respect to the duration of the disease, his experience differed from that of Dr. Kennedy and Dr. Beatty; the disease was seldom cured in less than ten days, and frequently lasted for a month or six weeks.

Dr. HART next read a successful case of Cæsarian operation, communicated by G. B. Knowles, Esq., Lecturer on Botany at the Manchester School of Medicine. The patient after being delivered of her fourth child, received an injury, which was followed by pain of the hip joint, and loss of power in the lower extremities. Since the commencement of this disease she had several miscarriages. In November last she was again seized with labour pains, and on examination, it was found that the sacrum projected in such a manner as to feel like the head of the child, narrowing the lower outlet of the pelvis to two inches by one. The operation was performed thirty hours after the commencement of labour, and six after the rupture of the membranes. Though the incision was made over the placenta, very little blood was lost, and the patient bore the operation extremely well. With the exception of tympanitis, she had no bad symptom for the first two days; on the third she had vomiting and hiccup, which yielded to treatment, and the tympanitis was removed by the use of turpentine. Owing to the distention of the belly, the lips of the wound could not be brought into apposition until the fifth day; in the interval a limpid fluid was discharged from the opening. The patient recovered in about a month.

Dr. HARRISON announced to the meeting that the next paper was from Dr. Corrigan, on *bruit de soufflêt*.

Dr. CORRIGAN. The sound to which *bruit de soufflêt* has been given is produced in various parts of the circulating apparatus. Its existence has been ascertained within a comparatively short period, and is due to the inquiring spirit of modern investigation. Few things are more interesting, as objects of pathological curiosity, than the production of sounds in the vessels of the human body under certain circumstances. The nature of these sounds has been examined with all the attention which the subject deserves, and not only has their existence been determined, but it has been found that they constitute some of the most important signs of disease.

It is interesting to inquire, on what peculiar mechanism *bruit de soufflêt* depends, as unless we are properly acquainted with the manner in which it is produced, we can never apportion to it its due importance, or estimate its proper value as an indication of morbid change.

The first part of this communication I shall not read; it consists of an analysis of the various opinions of others, as to the mode in which this sound is formed. I shall merely state, that Laennec supposed it to arise from spasm; and to Dr. Williams, who has followed him in the same path of inquiry, we owe the suggestion, that it might be found to arise from the operation of physical causes. Dismissing the examination of these and various other opinions, I shall proceed at once to the statement of my own views on the production of this sound, remarking *in limine*, that it is heard under a great variety of circumstances. We hear it in narrowing and in dilatations of the aorta, in narrowing of the ventricular opening from disease of the valves, and in permanent patency of the aorta, in varicose aneurisms, in aneurismal varix, in the vessels of the uterus during pregnancy, and even in vessels without any appreciable disease. For the production of *bruit de soufflêt* the simultaneous presence of the two following conditions are necessary:—first, an irregular current-like motion of the blood, (instead of its natural equable movement,) tending to produce corresponding vibrations on the sides of the arteries or cavities through which it passes; and secondly, a state of the arteries or cavities themselves, by which, instead of being kept in a state of tense approximation on their contained inelastic blood, (and which would necessarily prevent any vibration in their sides,) they become free to vibrate from the play of the currents within on their parietes, and by these vibrations give to the sense of touch “fremissement,” and to the sense of hearing “*bruit de soufflêt*.”

If you press on the femoral artery below Poupart's ligament, so as to diminish the calibre of the vessel, you necessarily diminish the supply of blood to the artery below the point of pressure, while the outlet through its branches continues as before. You do not interfere with the action of the heart above or the artery below, you merely diminish the area of the vessel at the part where pressure is applied. Now, if a finger be placed on the artery, a short distance below the point of pressure, a *fremissement* is felt, and if the stethoscope be applied over the same spot *bruit de soufflêt* is heard. This sound is present in a very remarkable degree in narrowing of the auriculo-ventricular openings of the heart. In this disease the free edge of the valves is most commonly the seat of morbid action, it becomes thickened and drawn in, and thus narrows the opening. Now the ventricle after each contraction leaves its sides in a flaccid state, favourable for being acted on by the next gush of blood from the auricle into the ventricle. The consequence of this is, that the fluid, passing through the narrowed auriculo-ventricular opening, is, in obedience to a well known law in hydraulics, thrown into diverging currents, and if the hand be applied to the chest a *fremissement* may be felt, and a loud *bruit de soufflêt* heard.

Having mentioned the occurrence of *bruit de soufflêt* in the narrowed state of an artery, as also in narrowing of the auriculo-ventricular openings, I shall contrast with those a peculiar condition of the aorta, viz. permanent patency of its mouth, in which the sound is

heard without any narrowing whatever. [Dr. Corrigan here exhibited drawings of the disease in question.] In some of these cases the semilunar valves have perforations or holes in them; in others they are thickened and bound back to the sides of the aorta; in others they are ruptured. In some instances, however, the valves remain healthy, the mouth of the artery becoming dilated, so that they cannot close across its mouth; and in these instances, how is this sound produced? It arises from the artery not admitting in these conditions of being kept in a sufficiently tense state, so that at the next rush of blood the blood sent in does not move equally, and this current-like motion of the blood playing on its sides produces in them corresponding vibrations, and the sound is heard.

I have noticed all these cases to show under how many various and seemingly contradictory circumstances it may occur. During pregnancy it may be distinctly heard in the vessels of the uterus after the fourth or fifth month. If we examine the state of these vessels, we shall find that the conditions necessary for the production of *bruit de soufflêt* are present. Their free anastomosis with veins and sinuses permits them to become partially flaccid in the intervals of the heart's contraction, their sides are thin, and the rush of blood into these comparatively flaccid tubes at the next contraction of the ventricle, gives rise to the current-like motion on which the sound depends. The existence of similar conditions will explain its occurrence in varicose aneurisms and aneurismal varix.

Having alluded to those cases in which it is heard in certain diseased conditions of the heart and arteries, I may notice those cases in which its occurrence is unconnected with vascular disease. If a patient be bled too much, or if an animal be dying from the effects of haemorrhage, this sound is heard in the heart and great vessels. Here, in consequence of the quantity of blood which has been abstracted, the equilibrium of the circulation is destroyed, and the arteries not having a sufficient quantity to keep them in a tense state, *bruit de soufflêt* is the consequence. We also meet with it occasionally in the healthy state of the heart, in nervous and irritable individuals. In this case the equilibrium of the circulation is destroyed by various causes of excitement, and the calibre of the vessels becomes disproportioned to the quantity of contained blood, so as to give rise to a certain degree of flaccidity of their walls. It is a well known observation, that this sound is never heard in plethora or inflammatory fever, for in these conditions of the system there is not room for the vibrations of the arterial tunics.

Dr. Corrigan concluded by detailing the following experiment in proof of the foregoing theory:

A small bladder in one instance, and a length of gum elastic tube or gut in another, were interposed between two cocks, the upper connected with a water cistern; the cock at the other or lower end being the discharging orifice of the bladder or gut. On allowing the water to flow through, the sound of *bruit de soufflêt* and the sensation of *fremissement* were perceptible in the intervening bladder or tube,

until (from the upper pipe pouring in fluid faster than the lower discharged it) the bladder or gut became tense, and then both sensations ceased, the discharge of fluid from the lower pipe continuing all the time. This experiment was applied to explain the occasional presence and absence of bruit de soufflêt in aneurisms; the sound being present in an aneurism, if the parietes can from any circumstance become at all flaccid in the interval of the heart's contraction, and being absent where the parietes are distended and tense.

Mr. CRAMPTON moved the thanks of the meeting to Dr. Corrigan, for the very able and interesting communication he had just read. He suggested an improvement in the mode of performing the experiment above described, and stated that he should feel happy to assist Dr. Corrigan on the occasion.

Dr. HARTY mentioned the occurrence of bruit de soufflêt in all the arteries in cases of polypus of the left ventricle, and stated that Dr. Corrigan's views explained some anomalous symptoms in those cases.

Dr. WILLIAMS stated, that Dr. Corrigan had not exactly stated his views with respect to bruit de soufflêt. He had attributed the occurrence of bruit de soufflêt to narrowing or obstruction of the vessels, but he did not deny that circumstances tending to modify the course of the blood might also have a share in producing it. With respect to bruit de soufflêt, he thought Dr. Corrigan's explanation would not apply to all cases, as for instance where the aorta was ossified. An ossified aorta cannot be compared to a flaccid tube, and yet in the former case a loud bruit is heard.

Mr. CARLILE asked, whether the bruit de soufflêt heard in permanent patency of the aortic valves, coincided with the beat of the heart, as under such circumstances it occurred to him that another explanation on the same principle might be given, namely, the rush of blood into the lax and dilated ventricle during the contraction of the aorta. He coincided with Dr. Corrigan's views of the mechanism of the sound.

Dr. CORRIGAN stated, that in many cases of permanent patency two bruits were heard, one almost present accompanying the diastole of the artery, the other immediately after, and explicable in Mr. Carlile's observation. Dr. Corrigan referred for more particular information to a paper published by him in the Edinburgh Medical and Surgical Journal, on "Permanent Patency of the Aorta." In reply to Dr. Williams's observations he would say, that he was aware of the existence of the bruit in ossification of the aorta. In such cases, when the first current has been thrown back the next impinges on a portion of the tube most likely to be thrown into sonorous vibrations. This circumstance had been already noticed by Dr. Wm. Stokes, and he had remarked, that where this intense musical sound occurs, you may guess fairly that the disease is ossification of the aorta.

A paper was read from Dr. Perry of Glasgow, in which many interesting deductions from an observation of several thousand cases of typhus were detailed, deductions we hope to see soon published.

Mr. L'ESTRANGE exhibited to the meeting his curved drill catheter,

and detailed its uses. It was looked upon as an extremely ingenious and safe instrument, and must prove an excellent adjuvant to the calculo-fractor.

The meeting then, on the motion of Dr. Hart, adjourned till Friday.

FIFTH DAY.

Friday, August 14th.

DR. PRICHARD in the Chair.

Dr. O'BEIRNE read an abstract of his views on the functions and diseases of the intestinal canal.

Dr. O'Beirne said, that his observations on this subject, first published in February, 1833, had elicited a very large share of attention, and were made the theme of considerable discussion. Several high medical authorities had adopted his views, while others had rejected them; and the matter had been taken up very warmly by the reviewers, who manifested on the occasion a remarkable difference of opinion. This, however, did not appear singular, when the prejudices in favour of old doctrines, and the dislike of new ones, were taken into consideration.

It would be remembered by those who were acquainted with his views, that the chief application of them was connected with the doctrines which he maintained as to the functions of the ileo-coecal valve, the sigmoid flexure of the colon, and the rectum. As to the ileo-coecal valve, he looked upon its action rather as a mechanical than a vital one. It formed a very perfect valve, and from various experiments which he had made, he had found it impossible to force a quantity of air or water from the colon into the ileum. With respect to the sigmoid flexure, he was of opinion, that when empty, it lay in the pelvis, doubled over the rectum; and that anatomists had fallen into an error in describing it as being situated in the left iliac fossa, a place in which it was never found, except when raised by faecal distention.

Dr. O'Beirne next proceeded to develop his views concerning the structure and functions of the rectum, and adduced several facts and arguments to disprove the objections advanced by Mr. Salmon. He showed that an elastic tube could be introduced into that portion of the canal and passed into the colon with great facility, and without exposing the patient to any risk of injury. A vast number of facts and observations were brought forward to show, that the rectum in its natural and healthy condition is never employed as a reservoir for faeces. In corroboration of this statement it was shown, that in cases where the integrity of the sphincter ani has been destroyed by disease, accident, or operation, incontinence of faeces seldom or never re-

sults, a circumstance which could not occur if faecal accumulations existed in the rectum.

From the results of his numerous experiments and pathological investigations, Dr. O'Beirne comes to the conclusion, first, that the ileo-cecal valve permits the faeces to pass readily into the colon, but prevents their return into the small intestines; secondly, that the cecum and colon, from their position and relations, must be always more or less distended with fecal matter; thirdly, when these become so distended as not to be capable of receiving any more, the small intestines must become also distended; fourthly, that faecal accumulations are never found in the rectum, except in cases of injury done to the nervous centres, followed by paralysis, and in very weak individuals of a sedentary habit.

With respect to the difficulties stated to be connected with the introduction of an elastic tube into the rectum, he did not believe in their existence. The operation had been performed even by nurses. He had met with some difficulty at first in prevailing on patients to submit to the operation, but this was very rarely met with at present. The instrument which he was in the habit of using, was the large syringe with a patent lever, manufactured by Mr. Weiss, and he used the same tube in infants and adults. The degree of force necessary to introduce it is sometimes great; but he had never seen any bad consequences from it, indeed it was almost impossible to inflict any injury with it, except in cases of organic stricture of the rectum, which were much more rare than generally imagined.

Dr. O'Beirne concluded by detailing several cases of dysentery, strangulated hernia, constipation, and tympanitis, in which the use of the tube was followed by speedy and effectual relief.

A communication from Dr. OSBORNE was next read. It was entitled, *Researches on the Effects of Cold and Climate, with a mode of measuring the degree of refrigeration in cooling bodies.*

It would be interesting (said Dr. Osborne) to ascertain by a tabular view the proportion of diseases produced by cold. To arrive at some information on this subject, I caused the patients in Sir Patrick Dun's Hospital to be examined some time ago, and found that out of fifty-seven cases of various forms of disease, thirty-four were attributed to cold. In these the cold was contracted in the following manner: twelve from damp clothing, five from wet feet, three from bathing, fourteen from exposure to cold currents of air while heated.

It is unnecessary for me to dwell on the importance attached to the investigation of the nature and effects of this powerful agent. The temperature of the human body, which may be estimated at 98° of Fahrenheit, is so equally and uniformly diffused, as to secure to all parts a nearly equal degree of warmth; and this has been further regulated by means of clothing, to as to enable man to adapt himself to the diversity of climates and seasons. Thus the Esquimaux of North America, and the inhabitant of central Africa, are equally intent on maintaining an uniform degree of temperature. In defending the

cutaneous surface from the injurious effects of cold, man had been eminently successful ; but there is a very extensive surface which he cannot protect ; he cannot prevent it from coming in contact with the vast expansion of mucous membrane in the lung. The expired air is always heated to near the temperature of blood, no matter how cold it might have been when it entered the lung ; and if we reflect that a quantity of air, equal to about twenty-eight cubic feet, is required every hour for the purposes of respiration, we may be able to form some estimate of the vast quantity of heat which is subtracted from the system in this manner. As all warm bodies give out heat in proportion to their temperature, and have a tendency to continue this process until the surrounding objects are raised to the same standard, it follows that the lung must, under ordinary circumstances, be constantly employed in adding to the temperature of the inspired air. This process, however, appears to go on with varying degrees of intensity, the air being more heated in the first than in the second step of the process, that is in inspiration more than in expiration, and that by the time it has got into the aircells it has acquired more than one-half its heat. What the source of this vast quantity of heat was, it was not easy to ascertain. That it was not dependent on respiration was proved by the experiments of Sir B. Brodie, who had found, that, although by keeping up artificial respiration the circulation went on, and the change of colour in the blood took place, still the body cooled down rapidly.

From these and other considerations it would appear, that we have good grounds to look upon respiration as a cooling process, by which, in certain states of the atmosphere, a vast quantity of heat is abstracted from the system. This view of the question leads to many interesting considerations connected with disease. In the sinking energy which accompanies many forms of mucous disease, when the coldness of the surface and extremities shews that the power of generating heat is far below its natural standard, the effects of reduced temperature assume a very important character. The air then receiving very little heat in its passage, reaches the ultimate vessels of the lung in a low state of temperature, the consequence of which is torpor of the capillaries, which are thus rendered incapable of acting on the blood ; and on examining the body after death, the right cavities of the heart are found to be gorged with blood. An unfavourable result of the same character may arise from the application of cold air to the surface of the lungs in low fevers, accompanied by coldness of the extremities and diminished vital energy. A knowledge of this principle may serve to explain the greater frequency of deaths by night under such circumstances ; it also suggests the propriety of attending to the temperature of the apartments where sick persons are lying, in order to prevent the operation of a cause so likely to prove injurious.

In the healthy individual, the effect produced by the application of cold air to the surface of the lungs is slight, and chiefly limited to the rima glottidis and larynx. This occurs most frequently in

passing suddenly from a heated apartment into cold damp air. When the air gets into the minute bronchial tubes, its effects are much less likely to prove injurious; it acquires such a quantity of heat during its transit, that its injurious properties are neutralized. It is a common opinion, that sleeping in damp apartments has a powerful tendency to produce cold. This, however, is found not to be the case, where the residents are careful in keeping their clothes dry. I was informed by a military medical officer, that by adopting a precaution of this kind, he had been able to preserve all his men from the effects of cold, at a time when they were quartered in a damp newly plastered barrack. Every individual in health raises the temperature of the bed in which he lies to 80° , and the only way in which cold can prove injurious, under such circumstances, is by being applied to the lung. I come now to consider the effects of cold on the stomach. This organ appears to possess but very little sensibility to cold or heat. We take tea at the temperature of 140° , and ice at the temperature of 32° , without the difference being perceived by the stomach. The impression does not seem to extend beyond the mouth and pharynx, and hence we frequently see persons who have taken very hot substances into the mouth, swallow them quickly to get rid of the sensation of heat. Cold seems to act on the stomach rather as a stimulant than a sedative. This is particularly observed with respect to ice. Many persons will feel thirsty, and drink in half an hour after taking an ice. In some instances the application of cold to the stomach proves highly irritant, giving rise to extensive and violent inflammation; this may be observed in that form of gastritis, which results from drinking cold water while fatigued after violent exercise. This, perhaps, may be explained by supposing that the overpowering influence of the cold produces, not reaction, but that torpor and distention of the vascular system, which, perhaps, is the character of inflammation in the first stage.

Where cold is applied to the surface of the body we observe two different results. Where the application is transient, and the circulation active, cold is followed rapidly by temporary vascularity, with increased heat, and redness. When severe, and continued for a length of time, it produces a paleness and shrinking of the part, followed at first by lividity, and afterwards by tumefaction. Taking these facts in connexion with the dilated state and diminished tonicity of the vessels, as proved by Dr. Alison, does it not appear that cold produces its effects by superinducing torpor of the part, which if not removed by transient reaction, will be followed by the more permanent and vigorous reaction of inflammation?

The various contrivances adopted by mankind to protect themselves against the influence of cold, by clothing, habitation, and artificial heat, prove how much its abstraction affects our comforts. Men of science have explored with assiduity the effects of temperature on the thermometer and hygrometer, and have observed its varieties with great care; but it must be confessed, that hitherto

meteorology has contributed little or nothing to our knowledge of the phenomena of health and disease. One consideration has been entirely omitted, and this refers to the cooling power of the atmosphere, as estimated not merely with reference to our senses. The human body is generally placed in a medium colder than itself. The degree of cooling power possessed by this medium has never been accurately measured, and is merely judged of by the sensation of the individual. I beg leave to introduce to the notice of the meeting a mode which I have employed for some time in measuring the degree of cooling power enjoyed by atmospheric air under various circumstances. The instrument which I employ for this purpose consists of a spirit thermometer without a frame, carefully graduated from 80 to 90 degrees inclusive. Having heated this to 90 degrees, it is exposed to the cooling influence of the air in different places, the space of time which the spirit takes in cooling down from 90 to 80, being the measure of the refrigerating power of the air. From several experiments which I have made with this instrument, I find that the cooling power is inversely as the time required to bring the spirit level from 90 to 80. The spirit thermometer is used in preference to one of mercury or water, because it is less rapid in its descent, and affords more time for observation. The numbers 80 and 90 are selected as including the ordinary range of temperature on the exterior of the body. The thermometer I use has a bulb of an inch in diameter, and a stem of six inches. The spirit is made to rise by heating the bulb with the hand or warm water. In order to insure accuracy, it will be necessary to have a number of these instruments (heated to 90) placed in air at the temperature of 60, and to select one of them which shall be found, on several trials, to cool down to 80 in the same given space of time.

The following is a table of the results given by this instrument in different experiments. Heated to 90, and placed in the open air, at a temperature of sixty, the instrument cooled down from 90 to 80 in three minutes, when at rest; when exposed to a slight breeze, it cooled down in one minute forty-eight seconds. In a temperature of 62, it cooled down, at rest, in three minutes; when fanned with paper, it cooled down in one minute and thirty seconds. In a temperature of $68\frac{1}{2}$, it cooled down, at rest, in four minutes; held by an individual walking briskly about, it cooled down in two minutes forty seconds. This shews that the rate of cooling in the same temperature, occurring in a person at rest, and in an individual exposed to a breeze, is in the proportion of five to one. Compare this with the fact recorded by Captain Parry; he found that in the polar regions, the men could bear the air at a temperature of zero while at rest, but could not when walking about. From the superior refrigerating power possessed by a breeze, it was very probable that if the persons who perished in the black-hole at Calcutta, had allowed one of their number to sit under the window, and fan the rest of the party, their lives would have been saved. The ordinary thermometer cannot measure this effect of the cooling power of air put in motion. In places along

the sea coast, where the cooling power of the air was very great, it afforded no information; and yet in such places a very appreciable difference will be shewn by the instrument which I hold in my hand. These observations will apply with increased force to the western coast of Africa, and the West Indies. If you look to Thompson's meteorological tables, you cannot find any thing in them, capable of explaining the vast difference, in point of danger, between the temperature of the day and night. This instrument, I think, would enable us to give some explanation of the bad effects connected with these changes, which are totally inappreciable by the common thermometer.

The following observations shew the cooling power, possessed by water over air of the same temperature. [Dr. Osborne here detailed a series of experiments, from which it appears that the cooling power of water is to that of air, in the proportion of fourteen to one. A similar degree of rapidity took place in the process of cooling, when the instrument was wrapped in cotton soaked in water.] From these experiments it could be seen, that a rapid diminution of temperature must occur in bathing, or remaining in wet clothes. It is well known, that in swimming, the exhaustion arises more from the effects of cold than muscular exertion.

There are many other applications of this instrument; what I have mentioned, however, is sufficient to prove the general correctness of its indications. My occupations do not allow me as much time as I should wish to devote to the pursuit of these investigations, and I hope the subject will be taken up by some person more competent and less occupied. I am not sanguine as to the results to be expected from this instrument; but I think it is likely to prove useful in testing the faults of climates, and throwing new light on the causes of epidemics, which appear to be so closely connected with climate and temperature, and which are at present so imperfectly understood.

Dr. GRAVES remarked that the observations so ably detailed by Dr. Osborne, were of an extremely interesting character, and likely to lead to very important results. He hoped the subject would be followed up.

Dr. CLENDINNING attached great value to the observations made by Dr. Osborne. He agreed with Dr. Graves and the author that the subject was deserving of further investigation.

Dr. GRANVILLE said, that it was his intention to propose at the concluding meeting of the General Committee, that a series of experiments should be instituted to that effect. They had appointed many committees on abstract and problematic subjects, and he thought they ought to appoint one on a subject which was likely to lead to the most important practical results.

Dr. HUTTON read an account of a remarkable case of deficient development and malformation.

The case (said Dr. Hutton) which I venture to offer to the notice of the section, occurred so lately, that I have scarcely had time to arrange the particular facts connected with it; but as it ap-

pears to me of considerable interest, I am induced to bring it forward. It is the case of an idiot named John North, aged 31, who died in the Richmond Hospital of a diffuse inflammation of the mucous and sub-mucous tissues of the pharynx and larynx, terminating in purulent infiltration and extensive bronchitis, and in whose body was discovered, after death, a remarkable deficiency of development in the right hemisphere of the brain, together with an original or congenital dislocation of the left hip joint, permanent flexion and pronation of the left hand, and atrophy of these members. I propose at present to confine my observations to the instances of deficient and perverted development. The head could not be said to be deformed externally, but the brain was small and the osseous case much thickened, particularly in the frontal region. Its fracture here was granular, there was no distinction between the tables and diploe, its inner surface was rough, and the dura mater closely adherent. A great part of the right hemisphere was deficient, and a serous cyst filled with limpid fluid, five inches in length, and between two and three in its transverse diameter, occupied the hiatus. The drawings will convey a correct idea of it,—one presents the cyst in its distended state, the other in its collapse. The inferior surface, or adherent portion of the cyst, corresponded throughout its whole extent to the medullary structure, and there was here no trace either of sulci or of convolutions, no subarachnoid effusion, or other indication of a recent inflammation in other parts of the brain or its membranes. After the drawings were completed, I regret to say, the brain was so soft from putrefaction, that no very minute examination of it could be effected; however, it was manifest that the optic thalamus, corpus striatum, tubercula quadrigemina, crus cerebri et corpus pyramidale of the same side were all less developed than the corresponding parts of the opposite side. The optic and other nerves appeared to be normal, as were also the arteries as far as they could be traced. There was no fluid in the ventricles, and the consistence of the cerebral mass was that of the healthy state. The circumstance of there being no trace whatever of cineritious structure underneath the cyst, (which in the recent state was quite transparent,) nor any appearance of sulci or convolutions in the same situation, seem to indicate a want of development rather than absorption of that portion of the substance of the brain. That the cerebral hemisphere bears some ratio in its development to that of the optic thalamus and corpus striatum; that nerves may be perfectly formed, though the parts of the nervous centres, in which they usually seem to be lost, may be undeveloped or more or less atrophied, and which was in this case exemplified in the condition of the optic nerves and of the tubercula quadrigemina; and that atrophy of the extremities of one side is found to coexist with deficient development of the cerebral hemisphere of the opposite, are observations which have been already noticed; the two former by Serres, in his work on the Comparative Anatomy of the Brain, and the latter by Rostan. The following short passage from the Translation of Andral's Pathology by Drs. Townsend and West, bears so

much upon this subject, that I trust I shall be excused in quoting it. [Dr. Hutton here read the passage, the object of which is to prove, first, that the formation and development of nerves are independent of the nervous centres, and more in relation to the organs supplied ; and secondly, that a very decided influence appears to be exercised by the brain and spinal cord over the nutrition and development of certain organs.]

I now proceed to notice the condition of the left inferior extremity, which presented a congenital dislocation of the hip-joint, a matter, I believe, of rare occurrence, and one which, as far as I have been able to ascertain, has not been noticed by any British author. This is the more extraordinary, as in the last work it has been mentioned that Paletta, an Italian surgeon, had noticed the affection, and that M. Caillard Billomier since published a dissertation on it in 1828. It is also noticed by Lafond. The nature of the affection seems to be, that from an imperfect or arrested development of the acetabulum, the head of the thigh bone is not lodged therein, but gradually drawn upwards on the dorsum ilii to a distance from the acetabulum in some degree proportionate to the weight which habitually bears upon the pelvis. Out of the twenty-six cases that occurred to Dupuytren it is said to have occurred in twenty-two or twenty-three instances in females, and in the same proportion on both sides of the same subject. It appears in some instances to have been an hereditary defect. Breschet regarded it as depending on an arrest of development in that part of the ilium that contributes to the formation of the acetabula, and on this account termed it a congenital dislocation. Dupuytren looked upon it as an original malformation, there being sometimes little or no trace of any acetabulum, but irregular osseous surface, and denominated it an original luxation. The late Baron Dupuytren is said to have observed twenty-five or twenty-six cases of this nature, and certainly he has given a very circumstantial account in a number of the *Reperoire* for 1826, and in his *Leçons Orales*. The case which I now offer, presents one or two peculiarities which he has not I think noticed. In the drawing marked A, the external characters of dislocation of the thigh bone, or the dorsum ilii, will be at once recognized by all practical surgeons. The projection and elevation of the trochanter, the shortening of the limb, its adduction inferiorly, and its rotation inwards, so that the great toe rests on the dorsum of the other foot, the acute retreating angle, and folds at the inner and upper part of the thigh ; the advance of the knee, and the slight flexion of the limb, all indicate this dislocation. The motions of rotation outwards and of abduction were limited, and in this case the difference between the greatest elongation and retraction of the limb did not exceed half an inch. In this last respect this case differed from those observed by Dupuytren, and was accounted for on the examination of the bones and their ligamentary connexions. The pelvis, with the exception of the acetabulum, was regularly formed and placed. The circumference of this articulating cavity formed nearly as large a circle as usual, but the upper and outer portion of its brim

was deficient the cavity was shallow, and its surface uneven, it was nowhere invested with cartilage. The fatty substance usually found there existed in rather a large quantity. The cotyloid ligament contributed little to deepen the cavity, but formed as it were a flat moulding over its circumference. The femur of this side, contrary to what has been observed by Dupuytren, was sensibly smaller than the other, but being measured from the trochanter to the outer condyle, was of the same length. The axis of its neck fell directly on the anterior instead of on the internal surface of the shaft. The relative position of the neck and shaft appeared as it might be supposed to do, if the lower portion of the femur being fixed, the upper portion were twisted forwards, the head moving through the one-fourth of a circle. This portion of the bone was smaller, more oblong, and more irregular in its form than is natural; it was but thinly and partially invested with cartilage. The capsular ligament was attached as usually to the circumference of the proper acetabulum on one part, and to the base of the neck of the femur on the other. It was exceedingly strong, and at the same time elongated or extended so as to allow the head of the femur to rest on the dorsum ilii, behind and above the anterior inferior spinous process, and near to the ridge that marks the posterior boundary of the anterior third of the dorsum ilii. This bone was not excavated in this situation to receive the head of the femur; but ligamentary bands passed from this part of the ilium to the external surface of the capsular ligament, where it invested the head of the femur. These must have served to strengthen and fix the capsule, and thus to prevent any great range of motion over the ilium. The ligamentum teres had its usual connexion, on the one part with the transverse ligament of the notch, and on the other with the head of the femur, but was elongated to the extent of four inches three lines, and flattened out through its whole length, so as to measure in some parts more than an inch in breadth. It was a tape-like ligament, which must have served not only to retain the head of the bone, but being interposed between this and the surface on which it moved, must have served also as an interarticular cartilage. All the muscles of this extremity were smaller and less developed than those of the other, but with the exception of a part of the obturator externus which looked fatty, their fibres had a natural appearance. There were no tendinous intersections, nor any other marks of previous laceration, violent injury, or chronic disease. The direction of the fibres of the several muscles around the articulation and upper part of the thigh, was noted and compared with those of the healthy side; but it is not necessary to detain the section with the account of them. They varied of course according to the altered relative situation of their lines or points of origin and insertion.

In this case it will be observed, there was no sensible effect either of violence or of devastating caries. The ligaments were of healthy structure, and though elongated retained their normal connexions. There was no broken fragment of acetabulum, the cotyloid ligament still surmounted its edge, and the cavity, though uneven and having no

cartilage on its surface, was covered with periosteum, and contained the reddish fatty substance in the state in which it usually exists in the depression. The thigh bone was atrophied throughout its whole length, but there was no evidence of ulceration, nor was there any deposit or change of structure in any tissue around the joint that could be ascribed to inflammation. Before the acute attack, of which he died, he was said to walk incessantly leaning the body forward, and sinking much to one side, in bearing on the toes of the dislocated extremity; he used no stick. The malformation appears to have been mistaken in this patient, as it was in several of Dupuytren's, for *morbus coxae*; at least there were the cicatrices of issues or moxæ about the joint. Its history is alone sufficient. We may add the absence of all results of inflammation, induration, cicatrices, &c., a certain degree of alertness of motion, a mobility in general of the head of the bone on the ilium, much greater than even in cases of the cures of *morbus coxae* with displacement, and frequently the striking diminution of the deformity, by making slight extension of the limb. From fracture of the neck of the thigh bone, I mean that condition of it in which, from the separation of the trochanter, the limb is rotated inwards, the impossibility of abduction and rotation outwards, even within the history of disease, is sufficient to distinguish it. It is only necessary to be aware that such an affection does exist, to enable us to distinguish it from the disease of the joint. When both hip joints are affected with this malformation, the deformity is very remarkable. In the very early periods of life, when the pelvis is small, and the heads of the thigh bones consequently not much separated, when, also, the trunk less constantly weighs upon the ligaments, the deformity is less marked, and the affection is overlooked. The difficulty of walking is ascribed to other causes. In old age, on the contrary, when the trunk is increased in weight, and the muscles are more feeble, the movements of the individual become most embarrassing and difficult.

The deformity produced is remarkable. Its degree, however, will depend upon several circumstances, for example, on the extent to which the ligaments have yielded, on the circumstance of their allowing a range of motion of the head of the bone over the dorsum ilii, or of the capsule being fixed to the ilium, and much strengthened. In some instances a new bony cavity, or depression, is formed, which limits the range of the head of the thigh bone; but this, which so frequently takes place to some extent in the neglected dislocations from injury, appears to occur rarely in this affection, and its infrequent formation may, perhaps, depend on the circumstance, that the laxity of the ligaments, freedom from suffering, and uninterrupted motion, prevent the head of the bone from resting in any particular place where this vital reparatory action could provide for its security. Dupuytren shews that this free range of motion does take place. He has observed the head of the bone to rise and fall alternately, through more than two inches, according as the weight of the trunk has been pressed or taken off the deformed extremity;

and he states, that he has seen a case, in which (when the patient lay supine) the pelvis pressing backwards, or rather downwards, separated the heads of the bones, so as to make each recede from the corresponding dorsum ilii, and the deformity abated. The figure and attitude of the body in standing or progression is extraordinary. There are some lithographic figures in the *Reperoire* to represent this, but it is to be regretted, that they do not correspond to the graphic description given by Dupuytren; the thighs appear in drawings as long, and even longer, than is normal. There is a great want of proportion between the trunk and the lower extremities, which are thin and shortened, as if, says Dupuytren, they belonged to a person of less stature. The pelvis is of the proper size, and the thighs, separated above to the extent of their transverse diameter, tend inwards, as if they would cross each other inferiorly. In addition to the prominence of the trochanter, and other external characteristics of dislocation on the dorsum ilii, Dupuytren notices the retractions of almost all the muscles of the upper part of the extremity towards the crest of the ilium, and the consequent denudation of the tuber ischii. The head is strongly carried backwards, the abdomen is prominent, the loins present a retreating curve posteriorly, and there is preternatural mobility in this region. The pelvis is placed almost horizontally on the femur, and the patient is said to apply the point of the foot only to the ground. In walking there is much waddling, as it is vulgarly called, and it is remarkable that the patient seems to run with less difficulty than to walk, which circumstance Dupuytren thinks is attributable to the more excited and vigorous state of muscular action. I shall very briefly notice the condition of the left superior extremity.

The forearm was permanently flexed on the arm, but was readily extended on the division of the biceps and brachialis anticus. The hand was also permanently flexed on the forearm, and also strongly pronated. The division of the flexor tendons enabled me to extend it to a considerable amount, but its state of pronation remained the same. After all the muscles were removed, the head of the radius was then examined, and the circumference of the head was found to be converted into an oval, the long axis of which was transverse, and it must be ill adapted to rotation; but when this was disarticulated ~~superiorly~~ the pronation continued. On examining the inferior cubito-radial articulation, it was discovered that the articulating surface, instead of looking outwards and forwards, presented inwards, and the styloid process seemed to have turned more to the radial side; it seemed as if the ulna were twisted half round at its lower part, and the radius must needs accommodate itself thereto. The convexity of the carpus, both longitudinally and transversely, was increased; and the cartilages on the posterior aspect of the scaphoid, lunare, and os magnum, being no longer useful, was attenuated or removed. The whole limb was atrophied.

Dr. GRANVILLE asked if Dr. Hutton was in possession of a cast

of the patient's head, and whether there was any difference of outline between the right and left sides.

Dr. HUTTON had not a cast of the head. He believed, however; that the roof of the skull was in Mr. Smith's possession. He had not observed any sensible difference between the right and left sides of the skull. Two gentlemen present, who had an opportunity of observing the form of the head, would bear him out in this assertion.

Dr. GRANVILLE, asked what was the character of the patient's mind.

Dr. HUTTON said, that he seemed to have very few ideas, and those of the simplest kind, principally connected with his sensations. He apprehended some ideas readily, but could not give them utterance, had little use of language, and articulated indistinctly. He had strong local and personal attachments, was very fond of his nurse and attendants, and frequently asked leave to go and see them while in hospital. He was inoffensive in his manners, well conducted, and of a cheerful disposition. He was not indifferent to money, and asked for his penny like others. During his illness, he frequently cried out to his medical attendant, "make me live, make me live;" and referred to the throat as the seat of his disease. The whole brain was smaller than natural; so was the cerebellum; but it was perfect in all its parts. No difference could be observed between the cerebral arteries on the sound and diseased side of the brain. He had a slight degree of strabismus, and it was thought by the nurse; that he did not see as well with the left eye as the right. He was thirty-one years of age at the time of his death, and had been always an idiot. He was a foundling, and nothing was known concerning his parents.

Dr. HARRISON said, that, taken in a physiological or phrenological point of view, this case was one of the most interesting which had come before the section. Dr. Hutton was fully entitled to the best thanks of the meeting, for the extraordinary ability and diligence which he had exhibited in working out the details of a case which had been only a few days in his possession. He agreed with Dr. Granville as to the importance of the case, and hoped it would be followed up.

Mr. HANDYSIDE said, he had met with a case of congenital luxation of both hip joints, in a subject which had been brought into his anatomical rooms at Edinburgh. The appearances of the joint corresponded very closely with those noticed by Dr. Hutton.

Mr. ADAMS read a paper on aneurism by anastomosis.

Mr. ADAMS commenced by stating, that it was Mr. J. Bell who had the merit of first directing the attention of the profession to this disease. Many were acquainted with it before his work appeared; the true arterial form of it, however, was generally confounded with true aneurism, and the operations, which were performed in ignorance of its nature, were imperfect and unsuccessful. It was pleasing to reflect on the good which Mr. Bell had effected; but still it must be acknowledged that our knowledge of the nature, form, and anatomical

characters of this affection were limited, and he did not think he was occupying the time of the section unnecessarily in attempting to throw additional light on the subject.

Much variety prevailed in the external characters and appearances of this disease. It sometimes occurs in the form of stains or naevi on different parts of the body of a Modena blue colour; in other places it assumes a vermillion tint. Here the disease is confined chiefly to the capillary vessels; in the former case to the arteries, in the latter to the veins. In others of these naevi a pulsation is found to exist; here the aneurismal condition is not limited to the capillaries, and extends to the neighbouring arteries. These grow very rapidly, bleed frequently, and often require an operation to save the patient's life. This operation, however, was not always successful. The surgeon is called on to operate at great risk, and it has not unfrequently happened, that in cases of the disease in children, death has occurred in *ipso opero*. Where these aneurisms are confined to the capillary vessels, the disease is generally mild; when they extend to the larger arteries and veins the consequences are more dangerous.

The first or simple form of the disease commences like a stain in the skin, of a claret or rose colour. Sometimes they are very small, sometimes they extend nearly over the whole body; the condition of the skin is altered, but there is no tumefaction. They occasionally remain quiet for years, but sometimes, particularly about the period of puberty, suddenly increase in size. Occasionally this state of the vessels is not limited to the skin, but also extends to the muscles, and even exercises inconvenient pressure on bones. One of the most remarkable forms of the last mentioned affection is that which sometimes attacks the tongue. It is seated in the veins, grows slowly, and has no pulsation. At other times it assumes a sudden increase of size, particularly in females during the menstrual period. [Mr. Adams here exhibited a drawing of this disease, as it appears in the tongue of a female. The tongue is much enlarged, and protrudes from the mouth. This, however, does not interfere with the patient's singing, or the pronunciation of the lingual consonants.]

The next case which he had to lay before the section, was one which had been operated on some years back at Mercer's Hospital, by Mr. Reid of this city. The disease had followed an injury of the lip, received at Trafalgar, and like the former was confined to the veins. Pressure had been tried in this case without effect; the tongue increased in size, and being frequently wounded by the sharp points of the teeth, vast quantities of blood were lost. It was to arrest one of these haemorrhages, that the common carotid artery was tied. It had the effect of producing a temporary shrinking in the tumour, but the disease remained unchecked, and the patient died some time afterwards from haemorrhage, produced by sloughing of the carotid at the situation of the ligature.

The next class of naevi were those connected with the arterial system. Mr. Adams here exhibited several beautiful drawings, by Mr. Conolly, to illustrate this form of aneurism by anastomosis. He de-

tailed the particulars of a case, which had been operated on successfully by Mr. Carmichael. The operation consisted in passing a number of threads (twelve or fourteen) through the tumour; this was followed by suppuration of the parts and withering of the aneurismal vessels. The only thing further he had to observe, with respect to this form, was that in females it sometimes became the seat of vicious menstruation.

The second part of the paper was occupied in considering the subject of aneurism by anastomosis. This disease was also first described by Mr. Bell, and is much adverted to by the French. In this disease the arteries are not only dilated, but also coiled up and extremely tortuous, presenting at various parts of their course nodosities, somewhat resembling the bulb of a thermometer. M. Breschet who has paid a great deal of attention to this disease, expresses in one of his publications, the regret he felt at not having had an opportunity of studying the disease in the living. Mr. Adams had a regret of an opposite description, he had not been able to examine it in the dead.—It was pleasant, however, to reflect, that the facts recorded by each would match the other, and tend to give a correct general view of the disease. [Mr. Adams here exhibited drawings illustrative of the form of aneurism under consideration.]

Aneurism by anastomosis is a disease in which the patient may live for years. The woman to whose case he had just referred, died not of aneurism but of consumption, and he had known patients to live with it for twelve, fourteen, and even seventeen years.

The last case to which he would allude was that of a woman whom he had recently visited, and whom he would be happy to shew to any gentleman wishing to examine the disease. In this case the disease had commenced about fourteen years since, on the left side of the neck, in the vicinity of the ear, and was attributed to a blow. It extended gradually downwards, and at present occupies the whole of the supra-clavicular fossa. The fremitus is not only distinct in the tumour, but can also be felt and heard over the mastoid bone on the opposite side of the neck. Its diagnosis is established by the history of the case, its duration, the appearance of the veins on the surface, and the remarkably distinct purring thrill.

With regard to the structures of these aneurismal conditions much obscurity still exists. Mr. Bell says, that it consists in a tortuous condition of the arteries. He states that there are three peculiarities to be observed in all such tumours; first, a congeries of small arteries; next, a congeries of absorbing veins; and lastly, of intervening cells.

Mr. ADAMS here took an elaborate review of the different accounts given of aneurisms by anastomosis, and stated that the structure of these tumours seems to be analogous to the erectile tissues. One of the best modes of ascertaining their structure had been adopted by the late Mr. Shekleton; this gentleman having injected the part through one of the largest vessels, and then by placing it in an acid solution, corroded its animal parts, leaving the vessels entire.

A magnified drawing of this preparation was exhibited to the meeting, shewing the retiform arrangement of the vessels, their tortuosity, and their abrupt enlargements at certain spots, and contractions at others. Mr. Adams concluded his elaborate paper by some interesting observations on the tortuosity of arteries.

A member gave an account of an aneurismal disease of the interior of bone, first described by Breschet. In some of the cases detailed, the division of the bone was followed by a gush of blood requiring the application of pressure. He had some doubts as to whether the last case detailed by Mr. Adams, was a case of aneurism depending on a diseased state of the capillaries.

Mr. ADAMS. I did not say that it was a disease of the capillaries. It is the larger arteries and not the capillaries that are diseased.

Dr. HARRISON said, that with reference to the tortuous state of arteries he did not think it could be looked on as a morbid condition; he would refer to the tortuous condition of the spermatic arteries, and of the horns of the deer, in proof of this view of the case.

Mr. ADAMS remarked that where any new action was to be carried on with vigour the arteries became tortuous, and this condition appeared to be the natural one. He would refer to the arteries of the brain in the child, and of the uterus and breasts in the mother.

A gentleman here exhibited to the meeting a very simple apparatus or applying galvanism to the human body in cases of chronic disease. It consists of a piece of linen, about the size of the palm, on which a powder composed of one part filings of silver, and two parts filings of zinc, are spread, and made to adhere by means of a solution of borax and shell lac in boiling water.

Mr. Snow HARRIS would trespass for a few minutes on the attention of the meeting. Sir A. Cooper, and many other eminent men, had doubted the possibility of union taking place in fracture of the neck of the thigh bone, within the capsular ligament. A case had lately fallen under his notice which he thought would tend to set the question at rest; it was that of a gentleman who had received an injury by being thrown from his gig several years before. He had got up and walked immediately after the fall, but continued lame from that period to the time of his death. He had been attended by some of the most celebrated surgeons in London; but they had not been able to determine whether there was fracture of the bone or not, but kept him lying on a sofa for nearly twelve months. The injured limb was shortened, the foot everted, the thigh wasted, and, owing to the constant inclination of the body forwards on one side, curvature of the spine took place. Some time ago the gentleman died, and Mr. Harris, being anxious to examine the parts, removed the acetabulum and a portion of the thigh bone, which he should feel much gratification in exhibiting to the meeting. He had found the trochanter higher up than natural, and the neck of the bone shortened. Lymph was thrown out on the head of the bone and

about the ligaments of the joint. Mr. Harris here exhibited the bone. He said that a section of it showed plainly the line of osseous union all throughout.

Mr. ADAMS was much inclined to doubt whether this could be regarded as a specimen of bony union after fracture of the neck of the thigh bone within the capsule. From a careful inspection of the head of the thigh bone and the filling up of the acetabulum, he would rather pronounce it a case of that form of disease which had been described by Mr. Smith as *morbus coxae senilis*.

Dr. McDowell was of a similar opinion. Looking at the preparation, which required a very careful examination, there were two circumstances observable in it which favoured this conclusion, the filling up of the acetabulum and the appearance of porcelaneous deposit. *Morbus coxae senilis* frequently appeared in persons of a gouty or rheumatic diathesis, as early as the fortieth year, the period at which the accident was said to have happened to the patient in this case.

Dr. GRANVILLE remarked, that while in Germany, he had an opportunity of examining the anatomical museum of Meckel, which contained a vast number of specimens of this kind, and that that celebrated anatomist had pointed out to him the mode in which persons might be deceived by taking the zig-zag lines of ossification for the line of an united fracture. He had also noticed the occurrence of porcelaneous deposits. Had it not been for the accident the gentleman met with, he would be disposed to reject altogether the idea of fracture.

Mr. COLLES said, that if the bone exhibited was a specimen of fracture, it differed from all the cases of fracture he had seen. He would suggest that more than one section of the bone would be necessary to ascertain the condition of the outer table with more accuracy.

After some further discussion, it was proposed by Mr. Harrison, that a committee be appointed to examine into the state of the case, and make such sections of the bone as would enable them to give a decided opinion as to whether it was a case of united fracture or not.

Dr. HANDYSIDE, of Edinburgh, presented a paper on the different offices of lacteals, lymphatics, and veins, in the function of absorption.

Having advanced that these three sets of vessels are one and all of them endowed with the faculty of absorption, he proceeded to lay down, as a general position, that each of these three systems of vessels is endowed with a peculiar office in the general function of absorption;

1st. That the lacteals absorb aliment, and refuse entrance to all other matters.

2nd. That the lymphatics remove the elements of the body which have become useless or noxious, to make room for the deposition of new matter.

3rd. That the veins, besides returning the blood to the heart, absorb various foreign matters.

1st. *Function of Lacteals.*—This appears to be decidedly to convey nutriment into the system, and that no other class of vessels can exercise that function would appear almost proved to demonstration by the experiments of Dupuytren, in which it was ascertained, that by applying ligatures round the thoracic duct of horses, death from inanition followed in all instances.

2nd. *Function of Lymphatics.*—Closely as the lymphatic system resembles the lacteal, even in the most minute details of anatomical characters, the vessels composing it nevertheless appear to have for their peculiar function the office of removing the debris of the body. After noticing the arguments of Dr. Hunter and Mr. Hewson as to this function being performed by the lymphatics, Dr. H. ingeniously observed, that in vegetables the debris, instead of being removed by vessels, are detached from their surface, as in the falling off of their leaves and the scaling off of their bark, or they are piled up in the interior of the individual, (as heart wood,) and preserved during the whole period of its existence; which circumstance, taken in connexion with the absence of a system of vessels in vegetables corresponding to lymphatics, may be regarded as affording a negative proof in support of the opinion here stated.

Dr. H. next alludes to the supposed communication between the veins and lymphatics, which he maintains does not exist except where great lymphatic trunks empty themselves into the venous system; thus showing an independent existence of the lacteal system, which argues in favour of their having to perform a separate function.

3rd. *Absorption by Veins.*—Several experiments were detailed, proving that the absorption of fluids from the surfaces of serous and mucous membranes, and from the surface of the skin, was accomplished by the veins and not by any other vessels. These experiments consisted in the exposure of fluids containing ferro-cyanate of potass and prussiate of potass to the serous and mucous surfaces, and to the skin stripped of its cuticle. Absorption of the fluids so applied took place, and by the application of suitable tests, the sulphate and deuto-sulphate of iron, the presence of the salts above mentioned was discovered in the blood, but never in the fluid contained in the thoracic duct.

The results of these experiments were similar to those of Fladrin, Tiedemann and Gmelin, and Magendie, and prove that absorption from the surfaces of the various organs is effected by the veins.

The last point alluded to is the absorption of foreign matters from the interstices of the tissues of the body.

Having pointed out in the experiments of Magendie, Edwards, Vavasseur, and Brodie, instituted with the view of proving interstitial absorption by veins, as an objection to the conclusions which these physiologists arrived at, that in every instance the substances acted upon were introduced into fresh wounds, by which

they were brought into contact with the blood passing into the vessel in its course to the heart. Dr. H. suggested and performed two experiments, which he considers to be free from the objections which he urges against the experiments of the foregoing authors.

They were as follow :

Exp. 1. Having made a fistulous opening in the abdominal parietes of a dog, I took advantage of the period when a complete granulating surface should be formed, to apply to it very freely the solution of prussiate of potass. On killing the animal three minutes after the application, and applying the appropriate chemical test to the blood, it was shown to exhibit traces of the poison.

Exp. 2. Was performed by applying prussiate of potass, in solution, to a granulating surface on the back of a cat, for four hours, and at the end of that period the presence of the poison was discovered by the test in the blood from the carotid arteries, but no indication whatever of its presence was observed in the lymph.

From all the reasoning advanced and experiments detailed in this paper, the author has considered it proved, that the absorption of foreign matters, occurring from the interstices and surfaces of the body, occurs solely through the channel of the venous system.

Dr. HARRISON now rose, and said that the duty devolved on him of moving the adjournment of the Section.

Dr. ALISON.—Before the Section adjourns, permit me, on the part of those who are about to return to their homes, to express their warm thanks, and a deep sense of gratitude, for the unvarying kindness and hospitality we have experienced since our arrival. Sir, the hospitality of your city is well known, and the feelings of her inhabitants are as generous as they are enthusiastic; but I must say, in the utmost sincerity, that never have I been so kindly received, never so gratified and amused as on the present occasion. But, Sir, there is another duty which we have to perform, another feeling which we are bound to express in terms no less vivid, in language of equal truth. We have to evince the high respect we do and always shall entertain for the talent, industry, and research, with which every branch of the profession is here conducted, and the great ability and spirit with which the science of medicine is here cultivated.

Dr. CLENDINNING.—I beg leave to add my humble testimony to the truth of every word Dr. Alison has uttered. I have been much, very much gratified with the proceedings of the present week, and shall bear back with me to England an abiding sense of the many acts of kindness I have received.

Dr. HARRISON.—I cannot but feel happy at the cheering evidences of union in feeling and purpose manifested on the present occasion. It augurs well for the interests of our section, and must be productive of good. Allow me to express my conviction, that I have never in the whole course of my life spent a happier or more profitable week. The interchange of good will and kindly feeling, the zeal for the interests of science, the collision of talent, illuminating as it touched the rich harvest of valuable information gathered, and the

planting of fresh seeds of knowledge, all tended to give to the present week a degree of unequalled interest. Permit me, Sir, to move before you leave the chair, the thanks and gratitude which we feel for the kind attentions and valuable co-operation of these distinguished strangers who have honoured us with their presence on this occasion.

Dr. GRAVES. I need not in such an assembly say, that I feel deeply gratified in having the honour to second that motion. Gentlemen, before we part, and while those feelings of mutual esteem and good will, those aspirations for the interests of medical science, in which we have all partaken, are still fresh and vivid, permit me to offer one word of advice. Do not omit attending every meeting of the Association. If the profession were to send its deputies in greater numbers to these meetings, such an union of talent and information would be likely to impress the nation at large with the importance of the medical profession to mankind. Without entertaining the slightest feeling of jealousy, I will assert, that among all the sections there is none more important, none more useful, than that which embraces the distinguished individuals which I now see assembled before me. I will state candidly, that I think the medical profession has not had its due weight in the British Association. But when I say this, let me not be misunderstood, I merely wish to stimulate the medical section to increased activity, I merely wish to excite the profession at large, to co-operate with more zeal in promoting the objects for which the British Association was formed, by attending each meeting in greater numbers, and by bringing to the common store a more abundant contribution of important facts, and well founded conclusions. To promote the attainment of so desirable an end, let Dublin, Edinburgh, and London, let the chief towns of all Britain vie with each other in the number and ability of the deputies they send to the medical section, at the next meeting of the Association. Dr. Graves concluded by seconding Dr. Harrison's resolution.

The SURGEON-GENERAL said that he felt great honour and pleasure in putting this resolution.

The Surgeon-General having now left the chair, and Dr. Granville having been called to it; Dr. Alison proposed, and Dr. Cledning seconded, a resolution of thanks to the Dublin profession.—The meeting then separated.

Dr. JACOB read a paper in the Zoological Section on the infra-orbital sinuses or *larmiers*, as they were called by the older French naturalists, in deers and antelopes; suggested by a recommendation of the Committee of this Section, at the Cambridge meeting, to investigate this subject. These sinuses are follicles or sacs capable of admitting the end of the finger, existing below the inner canthus of each eye. Dr. Jacob shows that they are not receptacles for the

tears, as the term *larmier* implies: the gutter which exists in some from the eye to the cavity, being in many species inadequate for the passage of the tears, and the animal inspissated residuum, found in the sac, not being such as should remain after the evaporation of that fluid. He explains satisfactorily the statements of the Rev. Gilbert White and Major Hamilton Smith, that these sacs communicate with the nostrils, by showing that air may be without difficulty in those animals forced from the nostrils through the *puncta lachrymalia*, which those observers supposed to come through the sacs or sinuses, which are altogether impervious. In fact, it appears that there can be little doubt that these sacs are follicles for the secretion of an odoriferous material, destined in these animals for the same purpose for which similar secretions are provided in different parts of other animals, as on the side of the head in elephants, the back of the peccary, the face of certain bats, the belly of the musk, and the numerous preputial and anal glands of others. This is particularly exemplified by the existence of a peculiar black secretion, which exudes in large quantity from the infra-orbital sinuses in the antelope *grimmea*, and in the existence of solid masses, like indurated ear-wax in old stags.

Dr. Jacob also read a paper in the Geological Section, respecting certain fossil coraloid, or madreporitic remains, pointing out the places and deposits in which they are found, and calling attention to the removal of the original animal carbonate of lime, the substitution of silex in its place, the involving of this again in a matrix of limestone, and its subsequent solution or removal, by which the original animal formation is again exposed in all its delicacy of organization. He also suggested the advantage of studying these and other materials found in alluvial deposits of similar character to those noticed, with the view of ascertaining whether they belong to the rocks in the vicinity, or are transported from more distant situations.



THE
DUBLIN JOURNAL

OF

MEDICAL AND CHEMICAL SCIENCE,

1 NOVEMBER, 1835.

PART I.
ORIGINAL COMMUNICATIONS.

ART. V.—*Practical Observations in Midwifery.* By WILLIAM F. MONTGOMERY, M. D., M. R. I. A., Professor of Midwifery to the King and Queen's College of Physicians in Ireland, and Physician Accoucheur to Sir Patrick Dun's Hospital.

III. On some peculiar Forms of Relaxation of the Uterine Tissue.

It is perhaps scarcely necessary to premise, that when the uterus has expelled the product of conception at any period of its growth, a process of active contraction immediately commences, by which, assisted by absorption, the structure of the organ is gradually condensed and rendered compact, and its volume is speedily reduced to its original dimensions. Under such healthy and favourable exercise of the natural functions the blood-vessels which enter into and permeate in every direction the uterine structure, and which have been hitherto in a state of

enlargement necessary for the nutrition of the ovum, are effectually compressed, and their orifices internally sealed up, so that no injurious loss of blood takes place either at the time of delivery or subsequently. But unfortunately matters do not always proceed thus favourably, the uterus being liable, under certain circumstances, to fall into a state of atony and relaxation, which is occasionally productive of the most deplorable results.

Now there are two conditions of this accident peculiarly formidable: 1. As it occurs immediately after delivery. 2. At periods more remote from the time of child-birth, as after several hours or days. These two forms of the accident are, I believe, now so generally understood, and have been so accurately described by authors, that I do not propose here to offer any observations upon them, as the reader will find elsewhere a very full and satisfactory account of the subject, particularly in the treatises of Ramsbotham* and Ingleby,† to which, therefore, I beg to refer him. But there is another variety of uterine relaxation, of whose existence I have fully satisfied myself in many instances, though it has not, as far as I am aware, been described, or even noticed by any writer; the peculiarity of it being, that it continues in a chronic form, occurring most frequently after early abortions, sometimes after delivery at the full time, when there has been profuse haemorrhage, and sometimes as the result of protracted or undue lactation. With regard to that form of it which follows early abortion, I should observe that it is not necessarily connected with any loss of blood during the miscarriage, as the cases to be detailed will show; but about the time that the patient is beginning to resume her ordinary occupations, and by taking more exercise, increases the rapidity and force of the circulation, she is unexpectedly seized with haemorrhagic and leucorrhœal discharges, considerable in quantity, and of course quickly inducing great

* Ramsbotham's Practical Observations on Midwifery, Part I. p. 186.

† Ingleby on Uterine Haemorrhage, Chap. 22, 23, and 24.

debility, and exciting painful and alarming apprehensions of the existence of some lurking malady. In general the patient experiences but little pain, most frequently none; but she feels an internal fulness, which appears to her to interfere with her passing water; she has a dull aching feel in the small of the back, and is constantly annoyed by a sensation of relaxation in the whole contents of the pelvis. If an examination is made the vagina is found unusually unresisting and relaxed, and the os uteri gaping wide open, with its lips tumid, thickened, and projecting, but at the same time soft and flabby; the cervix is dilated, so that the natural tapering form of that part is gone, and the body of the uterus itself is felt enlarged and doughy when pressed by the point of the finger, which however does not give any pain whatever, the organ appearing indeed quite insensible. This condition of the uterus may persist for many weeks, sometimes for months, being attended by various degrees of constitutional disturbance, as the discharges to which it gives rise may be so profuse as to endanger life, while at other times they are but slight, or appear only occasionally, and at length attract attention more by their long continuance, than from any great severity in the symptoms by which they are attended. The possibility of conception is by no means excluded during a moderate degree of this state of the uterus; indeed, on the contrary, my experience would lead me to say that it is very apt to occur under such circumstances; but if the tone of the uterus is not completely restored before the recurrence of pregnancy, abortion will almost inevitably happen as in Cases III. and IV. This, as well as other points in this general description of the affection, will probably be best elucidated in the details of a few cases which I shall now endeavour to give as briefly as possible.

CASE I.—In July, 1830, I was called to see a lady at the north side of the city, who had just miscarried in the second month of gestation, with profuse haemorrhage, by which she was much exhausted; the ovum had come away entire, and was

about the size of a walnut, and I learned from her that she had miscarried twice already within the preceding six months ; on this occasion she seemed to recover well, and was able to leave her bed in less than a week. I established a tonic system of treatment both in medicine and diet, but at the end of a month her strength had not returned, and she had never ceased to have vaginal discharges since the time of the abortion. Apprehensive that some portion of the decidua might be retained in the os uteri, I examined that part, and found it just in the state it had been in a month before, gaping open, soft, relaxed, and flabby. I now strongly recommended her to go out of town, and take a house on the sea-shore for the purpose of bathing, leaving her husband behind. This was done ; she continued to take small quantities of quinine and gentian with aromatic sulphuric acid, and bathed every day in the open sea until November, when she returned home completely re-established in health, and immediately afterwards conceived. She passed through her pregnancy without any tendency to abortion ; and on the 6th of the following August* gave birth to a fine healthy child, which, by my advice, she attempted to nurse, and for the first time succeeded perfectly. She had previously had five children, and has had two since, which she also nursed, and is now in better health than she had enjoyed for years.

CASE II.—On the 29th of January, 1832, Mrs. V. sent for me in consequence of being, as she thought, threatened with abortion in the third month, having had a similar accident at the same period of gestation in the preceding June. She had now a good deal of fever about her, with some red and glairy discharge from the vagina, but no pain. On examination the os and cervix uteri were found in a natural and healthy state, and gave no indication of an impending abortion, which, how-

* This lady told me on the 10th of December that her confinement would take place on the 5th of August ; she had a few pains on the 4th, and again on the 5th, and was delivered on the 6th.

took place on the night of the 30th, without either pain or haemorrhage. While she was passing water she was conscious of something solid passing from her, but did not know she had miscarried until she saw the foetus in the morning ; it was of the third month, very much decomposed and altered in form, in consequence of which she became impressed with a very whimsical notion : she had been some time before greatly startled by a hatching hen which flew up into her face, and she now quite gravely asked me if I did not think what she had been delivered of was very like a chicken. She appeared to recover well, and at the end of a week was able to go about as usual. On the 29th of March, just two months after the miscarriage, she sent for me, and informed me that from the time of the abortion she had never been entirely free from vaginal discharge, which was occasionally accompanied with pains resembling slight after-pains ; she was also annoyed with vesical irritation and dysuria, and was now much alarmed from an apprehension that she was labouring under gravel, or was threatened with cancer. On examination I found the uterus almost exactly in the state I had felt it two months before, after abortion had taken place ; the os uteri gaping open to the size of a shilling, with its margins soft, relaxed, and puffy, but totally without tenderness on pressure. She was ordered the same tonics as in the former case, and to use free ablution of the lower part of the trunk with cold salt water, which was to be exchanged for the open sea bath as soon as the weather should permit. Under this treatment her health was perfectly re-established in about six weeks, during which time she lived *absque marito*. She conceived again towards the end of May, and was delivered on the 27th of February, 1835.

CASE III.—May 12, 1834, I was urgently requested to see a lady, sister to the patient, Case I., and mother of six or seven children, her family having become greatly alarmed for her safety in consequence of profuse haemorrhagic discharges. On seeing her I ascertained that a little more than three weeks

previously she had miscarried early in the third month, with very little pain or haemorrhage ; she had apparently recovered well, so that at the end of a fortnight she went to church, but while there she felt greatly fatigued, and was seized suddenly with a smart uterine haemorrhage, in consequence of which she nearly fainted, and it was found necessary to have her conveyed home. She was visited by her medical attendant next day, who established a rigorous system of low diet, and water for drink, with full doses of laudanum, and the constant application of cloths wet with vinegar and water ; in addition to which a bag of chalk, moistened with vinegar, was introduced into the vagina. Under this plan, which had been pursued without intermission for a week, matters became much worse, and when I first saw the lady she was lying on a sofa in her bed-room, unable to move, and almost without pulse, the countenance blanched and ghastly, the whole body chilled, and shivering with cold, from being constantly sooused in wet, and the mind depressed to the lowest degree of despair. On examination I found excessive relaxation of the vagina, the os uteri so open that it would readily have admitted the points of three fingers, its lips tumid, but soft and puffy ; the body of the organ enlarged and doughy. I recommended the immediate removal of the wet cloths, and the application of dry and warm ones in their place, and a jar of warm water to be applied to the feet ; a scruple of ergot of rye to be given infused in warm wine ; the diet to be exchanged at once for jelly, good broths, chicken, and claret ; tonics as in the former cases, and removal into the country as soon as it could be accomplished with safety. Under this system the lady was soon much better, (as I was informed, for I saw her only the once at that time), but she remained in town, and conceived again about the end of June, and again miscarried on the 15th August, when I attended her ; there was no haemorrhage of any consequence, but the uterus was still evidently in a relaxed condition, which however I obviated by rest in the horizontal position for several days, allowing a generous

diet, and administering tonics early. I also prevailed on her to leave town, and go to the sea side, her husband remaining at home. She continued in the country till the beginning of winter, by which time she had completely recovered her health and strength. Soon after her return she conceived again, and on the 9th of the present month, September, was safely delivered of a daughter.

CASE IV.—Early in the summer of the present year I was requested by Dr. Sparks to see a patient, in whom I found this condition of the uterus very strongly marked, and it had given rise to a suspicion of the existence of malignant disease, of which however there was, in my opinion, no trace. On inquiry I ascertained that the symptoms had been going on at intervals, from the time of a miscarriage on the 18th May, 1834, a second miscarriage having occurred at the latter end of July following, and a third on the 3rd February, 1835; all through, except when miscarrying, she has had little or no pain, has slept well, and preserved her appetite, in consequence of which, although her face is blanched by the repeated discharges, she has not emaciated. Under the use of tonics her health has greatly improved, and when I last saw her in July there was some reason to believe that she had again conceived, as she was experiencing many of the symptoms which had attended her pregnancy in former instances.

§ 2. The existence of relaxation of the uterine tissue after profuse haemorrhage is what we would naturally anticipate under circumstances of such extreme exhaustion as almost necessarily follows such an occurrence; when the state of the organ appears to be identified with that of the other muscular structures throughout the body, participating in their loss of tone; and the observation of the fact promises to be useful so far as it suggests to us, in addition to other general considerations, that under such circumstances, besides the more obvious indications of using restoratives for the general powers of the system, the local application of tonic

agents, and the use of specific stimulants, for the purpose of bracing the uterus, may be resorted to with advantage. Haemorrhage may of course be an adventitious debilitating cause in the case of abortion, as in Cases I. and IV., and then it and the relaxation will act and react, producing each other reciprocally, in the successive relation of cause and effect; which chain of morbid actions can only be effectually broken by withdrawing the individual from the possibility of conception, until by proper treatment the constitution is restored, and the organ more immediately disabled has recovered its healthy tone by being, as is said in agriculture, allowed to lie fallow for a season; the good effects of which is seen in some of the foregoing cases.

The various practical considerations connected with this part of our subject would, if followed out, lead into a very wide field of discussion, on which I do not propose to enter at present, beyond submitting the outline of a case in which this relaxed condition of the uterus was ascertained by dissection four weeks after labour, accompanied by profuse haemorrhage.

CASE V.—M. T. was delivered on the 20th May, after profuse haemorrhage, produced by the implantation of the placenta over the os uteri; for some days she went on favourably, but being exposed to much annoyance, and greatly mismanaged by friends about her, she was seized with low fever, and an affection of one of the limbs resembling phlegmasia dolens, and died at the end of a month. On examination after death the uterus was found considerably larger than it ought to be at such a period after delivery; measuring four inches and a quarter in length, and more than two and a half in breadth; its cavity would easily have contained a small hen-egg; the os uteri and cervix quite open, and sufficiently relaxed to allow the introduction of my forefinger; its parietes were about three-eighths of an inch thick, with their structure as soft and flabby as that of any other muscle in the body, so that it might be rolled round the finger, and when divided by the knife the vessels were found uncontracted and pervious. From the result of several instances in which I have had occasion to make examinations in such

cases during life, I have learned that this state of the uterus is of very frequent occurrence under such circumstances; in connexion with which there is a question which very often meets us in practice, and which it may be proper to notice here,—ought patients who have experienced considerable haemorrhage in labour be allowed to nurse? In my opinion they ought, if there be not some other reason to object to their doing so, because unquestionably the mammary excitement and irritation which accompany the early part of lactation, propagate their influence to the uterine system, promoting there active contraction, and so assisting very decidedly in speedily restoring the organ to a condition of permanent safety: indeed it appears to me very probable that the occurrence of chronic relaxation after early abortion (independently of haemorrhage) so much more frequently than after delivery at the full time, or the more advanced periods of pregnancy, is probably to be attributed to the want of the mammary excitement occurring under the latter circumstances, especially when the mother nurses; and even when that is not the case she has at least the benefit of the stimulus given to the uterus by the increased action in the breasts for the formation of milk. But for the very same reason that we would sanction and recommend nursing for a short time, we may find it necessary to prohibit its continuance beyond half or quarter the period through which it is usually carried on, should it appear to be disagreeing, and producing the well-known consequences of undue lactation, the injurious influence of which, let it be remembered, is to be recognized and estimated by the degree of disorder effected in the system, and not by the length of time the process of suckling has been continued; indeed this is a point of which every day's experience convinces us, that one woman will suffer more exhaustion and constitutional derangement by three month's nursing, than will another by twelve, or even more: and one of the ill effects thus produced is, I have reason to believe, this very condition of the uterus which we have been here considering.

§ 3. It is perfectly well known that when nursing disagrees, or has been too long continued, a very prominent group of the symptoms experienced are precisely those which are found to accompany relaxed states of the uterus induced by other debilitating causes: the patient complains of uneasiness and distress referred to the stomach, with disordered digestion, pain affecting the small of the back, leucorrhœa alternating with frequent returns of sanguineous discharges, and from examinations made under such circumstances I have learned that the condition of the uterus which I have been describing is very frequently, if not always, induced in a greater or less degree; of which the following case affords an example.

CASE VI.—In July last I saw a lady of healthy aspect, and apparently sound constitution, who had been nursing for nearly seven months, with an inordinate quantity of suck; her system had become greatly affected, and she presented many of the morbid effects of undue lactation, such as derangement of the digestive organs, pain in the back and left side, with almost constant slight red discharges, and occasional leucorrhœa; an internal examination being considered necessary, I found the vagina greatly relaxed, the uterus had slightly descended, was evidently enlarged, and softened in its texture, and the os uteri sufficiently relaxed and open to admit readily the end of my finger. Immediate weaning, attention to restore the impaired digestive organs, a few tepid salt water baths, tonics, removal to the shore of Wicklow, and sea-bathing, soon completely restored her health.

This day, September 9th, this lady called on me, and informed me that the irregular discharges have entirely disappeared, and that the catamenia have returned twice at the proper periods.

This subject of the morbid effects of undue lactation has been very ably treated of by Dr. Marshall Hall,* and I refer

* *Commentaries on Diseases of Females*, Part I. p. 230.

with much satisfaction to his highly philosophical account of the state of the system under such circumstances, because the symptoms he describes, and the altered conditions of certain functions, as observed by him, are perfectly in unison with the existence of such a state of the uterus as I believe to be the proximate cause of some of the morbid phenomena, while it is itself, in common with some others, a joint effect of the general relaxation and exhaustion brought on by the undue lactation. Thus he notices, as a prevailing symptom, profuse menorrhagia, alternating with leucorrhœa; he mentions that, in common with other organs, "the uterus suffers," p. 230, but he does not specify how; and the derangement of the alimentary canal appears to him to "consist in loss of tone and power," p. 233. In all this, as well as in the whole tenor of his observations, I fully concur with him, and have only to add to what he has said, that what "the uterus suffers" is relaxation, both of its tissue, by which its vessels are allowed to discharge their contents too readily, and of its connexions, by which it acquires a tendency to prolapse; and I wish to observe here, as confirmatory of a former remark on the same subject, that when patients who have been recently exhibiting the peculiar symptoms of undue lactation happen to conceive within a short time, they very generally miscarry; an accident which I believe to be owing to the relaxed and debilitated condition of the uterus at the time.

Treatment.—The plan of treatment which appears to me suitable is sufficiently explained in the cases related, to render it unnecessary to enter much into minute details. The class of medicines that will do most service are tonics, such as sulphate of quinine, or other preparations of cinchona, gentian, columba chalybeates, mineral acids, country air, bathing in the open sea, and cold topical ablution. Should the haemorrhage burst out so profusely as to endanger life, or produce great exhaustion, means should of course be adopted to arrest it on the instant, for which purpose the tampon with pressure and the ergot of

rye are the means on which generally our greatest reliance ought to be placed. *Occasionally* an opiate, or the application of cold, may be used with advantage; but I cannot avoid observing, that the indiscriminate liberality with which both these remedies are applied in practice is greatly to be deprecated. As to cold, the common modes of applying it are highly injudicious, and often absolutely hurtful: a napkin is soaked in cold vinegar and water, and laid on the external parts, or over the pubis, where it is allowed to remain until it is removed smoking with heat; this is mere trifling, a pretence of doing good, without the least probability of benefit. At other times the patient is kept for hours or for days, as in Case III., surrounded with wet and cold, chilled and shivering, until the powers of life are sunk to the lowest ebb; and I have before me notes of two or three other cases in which a similar plan was pursued, until the patients were reduced to a state of the most alarming depression, which was instantly exchanged for one of comfort and safety, by substituting dry and warm cloths for damp and cold, and excluding the chilling blasts from an open window at an inclement season of the year. The general principle on which we should use this remedy appears to me to be this, that its greatest benefit is to be expected from the suddenness of its application, acting as a stimulus to contraction, and not from the protracted influence of its refrigerating power,* the result of which is very often the increase of the prostration which we intended to relieve: *ne quid nimis* embodies a rule not less laudable here than on many other occasions in the practice of midwifery. The opinion of Pasta† so fully embodies my own ideas on this point that I must beg leave to quote

* Baudelocque, speaking of the use of ice and snow for such purposes, says, "Quand leur contact ne determine pas a l'instant le resserrement de l'uterus on ne doit plus guere compter sur leur efficacite, c'est leur premiere impression qui doit faire cesser l'inertie."—*Traité des Hémorragies*, p. 240.

† *Traité des Pertes de Sang*, tom. ii.

his words. "L'emploi de ces moyens demande beaucoup de prudence, car il importe de proportionner les degrés et la duree du froid aux forces de la femme. Sans cette precaution, ou risquerait de provoquer en elle des frissons qui mettraient la vie de la malade en danger, ou qui redoubleraient les accidents auxquels on se propose de remedier." It may not be considered misplaced here just to mention, that in a case which I lately saw of dangerous relaxation of the uterus, which occurred *eight days after delivery*, the lady experienced more comfort and support from swallowing a few spoonfuls of water-ice than she did from the use of any of the usual stimulants. With regard to the ergot of rye, I wish to observe that the benefit which is now so well known in many instances to follow its administration in cases of protracted menorrhagia* appears, from what we know of the specific action of that peculiar remedy, strongly confirmative of a belief that those irregular and excessive discharges are often dependent on such a relaxed state of the uterine fibres as we have been considering.

It remains for me now only to observe that a correct appreciation of the nature and exact characters of this affection is of the utmost importance in practice. 1st. Because from the accompanying discharges, and the debility thereby induced, it constantly leads to a suspicion, on the part of both patient and practitioner, of the existence of organic uterine disease, a suspicion which a vaginal examination rather tends to confirm than remove, the organ being found increased in size, with the cervix and os uteri tumid and puffy, and I am strongly disposed to believe that this is really the condition of the uterus represented by Madame Boivin, 23rd Plate, Fig. 1, which she describes as "a scirrhouss tumefaction of the posterior lip of the os uteri, taken from a woman who died of pulmonary consump-

* See a highly interesting case of this kind, which occurred after a tedious labour, a cause very likely to debilitate the uterus, in Dr. M. Hall's *Commentaries, &c.*, p. 206.

tion *after an abortion* in the sixth month of pregnancy.^{**} 2ndly. Because if proper measures are not used to remove this condition of the organ, it breaks down the health by profuse discharges, and by inducing a repetition of abortions ; for, instead of preventing conception, in the cases which I have seen, it has been already remarked that the subjects of this affection have proved pregnant more quickly than usual.

ART. VI.—*Cases of Aneurism, in which some unusual Circumstances were observed.* By JOHN BROWNE, M. D., one of the Surgeons of Saint Mark's Hospital, and formerly Surgeon to the County of Meath Infirmary.

[Read before the Surgical Society of Ireland.]

WHEN we consider the rapid progress which surgical pathology has made within the last fifty years, it appears surprising that so many of the subjects which come within its province still require elucidation ; on this account it is that the opinions of our best practitioners are so divided as to the propriety or impropriety of employing certain modes of treatment for the cure or alleviation of many of our most important diseases ; and to none of the heavy catalogue of maladies may this observation be applied with more propriety, in my opinion, than to the disease of aneurism.

Looking back to the labours of Guattani, Deschamps, and the Hunters, in an age gone by, and to those of Scarpa, Hodgson, and Guthrie, in our own day, we might fairly imagine that the subject of aneurism would neither demand nor admit of any farther improvement : but what do we find in practice ? uncertainty and difference of opinion ! Our neighbours, the French,

* " A la suite d'un avortement dans le sixième mois de la grossesse."—*Maladies de l'Uterus, &c. Atlas*, p. 22.

very generally prefer the old operation of opening the sac and tying the artery above and below the place of its disease or injury ; occasionally too, employing the now nearly exploded safety ligatures.* The Italians, although so justly proud of their great Scarpa, are extremely timid in the treatment of diseases of blood-vessels, and operate as seldom as they can ; on such occasions using either a broad tape to constrict the artery, or opening the sac according to the French method.† As to ourselves, some use a presse-artère, others a catgut ligature ; many employ two ligatures, most persons one ; some prefer tying the artery on the distal side of the tumour, and others again, disliking operation altogether, trust very much to compression and Valsalva's treatment.‡

With a view to assist, in some degree, in establishing a more precise line of practice for the treatment of this interesting disease, I shall relate a few cases, which occurred in my own practice or under my personal observation ; and in all of which some unusual circumstances took place, whether as regarding the cause of the disease, the method of treatment adopted, or the consequences which ensued.

CASE I.—Aneurism of the Posterior Tibial Artery ; Scarpa's Operation successful ; Formation of Sinuses in the Course of the Sartorius Muscle ; Death.

A labouring man, twenty-seven years of age, but more slender and delicate in appearance than persons of his class usually are, was admitted into the County of Meath Infirmary on the 27th of August, 1817, complaining of numbness and uneasiness in the right lower extremity, particularly in the neighbourhood of the knee joint, and aggravated by exercise ; in consequence of

* Roux, Boyer, Richerand, Delpach, Larrey.

† Mackesy in Ed. Med. & Surg. Jour. vol. xi. p. 401. Scarpa, *passim.*
Annali Di Medic. et Di Chirurg. Di Milano, vol. lxiii. p. 353.

‡ Crampton, Abernethy, Sir A. Cooper, Guthrie, Wardrop, Freer, Sir William Blizard.

which he had been prevented from following his usual occupations.

On examination, an aneurism of the posterior tibial artery was detected; thus circumstanced: a round pulsatory tumour, resembling a small orange in size and shape, existed in the centre of the upper and back part of the calf. It was deep-seated, lying apparently beneath or in front of the belly of the gastrocnemius muscle; its upper edge was placed nearly three inches inferior to the lower margin of the popliteal space, and it extended downwards and laterally more than two inches in each direction. Pressure on the femoral and popliteal arteries arrested the pulsation, and diminished the size of this tumour. The pulse at the wrist was 80, somewhat sharp, but synchronous with that of the heart and aneurism. The state of the tongue, appetite, and bowels, was normal. The disease had existed about two months without assignable cause, but his attention had been directed to the tumour not more than a fortnight, during which time it had scarcely increased in size.

Some opening medicine having been administered, Scarpa's operation was performed on the 1st September. Considerable difficulty was experienced in tracing the line of the sartorius muscle, partly from its being of an unusually small size, but principally from the awkwardness of the assistants, by whom the position of the limb was twice inadvertently changed. From both these causes, the external incision was made lower down than was intended, and uncovered the belly of the muscle; which required to be turned at least half an inch to the outside, to enable the operator to lay bare the sheath of the vessels at the point where he intended to apply his ligature, namely, the vicinity of the apex of the inguinal triangle, so familiar to anatomists. A portion of the sheath having been raised in the forceps, was divided horizontally for about one-fourth of an inch, and a bent probe, armed with a double ligature, was passed under the artery from within outwards; the instrument being then removed, each ligature was tied with a double knot close

to the separated portions of the artery. On the upper ligature being drawn, the pulsation in the tumour ceased, and its size diminished considerably. Not more than an ounce of blood was lost, although two of the external pudic vessels required ligatures; and the operation, excepting its first stage, was sufficiently simple. The usual dressings having been applied, and the limb wrapped in flannel, he was put to bed, and enjoined to observe quietude and abstinence.

2nd Day. Limb easy and of natural temperature, except the toes, which were cool: symptomatic fever; headache, with flushed countenance; pulse 110, extremely hard, especially on the right side, where the artery beat with nearly double strength.

V. S. ad 3xx. Purgatives and Diaphoretics.

3rd Day. Bowels open; fever less; headache removed. A burning or smarting sensation about the ankle. Aneurismal tumour scarcely discernible. Pulse 120, even harder than before.

V. S. ad 3xx. Purgatives and Diaphoretics.

4th Day. Blood cupped, but without buff. Bowels free; skin moist; pulse 110, soft, and weak. No uneasiness in the limb. No union in the wound; its edges were separated, and the discharge considerable.

Effervescent Mixture; Laxatives; Antimonials.

10th Day. The lower ligature came away, the upper one having been detached the day previous. Fever gone; pulse 90, vibrating and soft; slight lividness of the integuments covering the outer ankle; wound languid and indisposed to heal. Limb to be semiflexed and laid on the heel.

Decoctum Cinchonae cum Acidio. Full diet.

16th Day. Discharge one-half diminished; wound healing; slight superficial ulceration between the two last toes; discolouration of the ankle stationary; the aneurismal tumour had been

reduced to a small hard substance, the size of half a nutmeg; pulse 90, of equal strength in both wrists.

Contr. Remedies.

25th Day. Had, for the four preceding days, complained of soreness beneath the wound in the line of the artery, increased on pressure, which soreness then extended half way to the knee; a sinus had also formed above the wound, and communicated with it; the granulations were languid; the pulse 90, and weak; the appetite indifferent. Pressure to be made over the sinus by compress and roller. To lie on the right side with the buttock raised.

3 vi. of Wine daily. The Bark Mixture to be continued.

31st Day. A copious discharge from the sinus, which seemed to extend deep, and a slight redness of the skin at the upper and inner part of the groin, close to the artery; discolouration of the ankle lessened; hectic symptoms, as flushed cheeks and diarrhoea; pulse 100, weak; appetite bad; thirst; had slept ill from uneasiness in the limb.

Acid. Sulphuric. dilut. Mist. Cretæ cum Opio.

Omittr. Decoc. Cinchonæ. Contr. Vinum.

Compression as before. Additional Meat.

36th Day. A counter opening was made through the discoloured skin, and it was also in contemplation to make another below, but the probe being found to pass nearly its entire length along the inner side of the sartorius muscle, and deep in the flesh of the thigh, such an operation was found impracticable; discharge very considerable, and much increased by pressure in the course of the femoral artery; pulse 120, weak; œdema of the foot.

Pulv. Cinchonæ cum Pulv. Aromat. ex Vino.

Contr. Cætera.

41st Day. Had been losing ground, with increase of the hectic symptoms, and was then evidently sinking. The day

before he had complained of thoracic uneasiness immediately behind the centre of the sternum, which had become augmented, with slight lividity of his countenance. Pulse 140, and weak.

A blister to the chest was prescribed, which did not rise, and he died in the evening.

I have thought the foregoing case worthy of notice, inasmuch as it is the only instance which I recollect to have seen, where the formation of sinuses along the sartorius muscle took place subsequent to the high operation for aneurism of the thigh; and I am disposed to agree in opinion with Scarpa,* as to the infrequency of its occurrence after that operation.

It may now be worth while to inquire into the causes of such an untoward event, which must, even in the most favourable cases, protract recovery more or less. Scarpa attributes its occurrence to inflammation and death of the cellular tissue in the course of the artery, produced by the undue disturbance of the sartorius from its situation; and brings forward, in confirmation of his views, the ill success of the Hunterian operation in many instances.† Sir Astley Cooper‡ and Mr. Hodgson,§

* *A Treatise on Aneurism*, Wishart's Translation, page 287, second edition.

† "John Hunter, for the cure of popliteal aneurism, tied the femoral artery a little below the middle of the thigh. He was therefore under the necessity of making the incision of the integuments and of the cellular substance of the thigh in a direction not quite parallel to the sartorius muscle; and he was obliged to raise and turn back the internal margin of this muscle, to lay bare sufficiently and tie the femoral artery before it passes to the ham through the tendon of the great adductor muscle."

"And this displacement and reverting of the internal margin of the sartorius muscle were reckoned amongst the principal causes of the copious and long suppurations, and of the sinuses by which the operations for aneurism, performed by this illustrious surgeon, were often followed."—Wishart's Translation, p. 305, 2nd ed.

‡ "Any disturbance of the sartorius muscle prevents the ready adhesion of the wound."—*Lectures by Tyrrel*, vol. ii. p. 58, (talking of operation for femoral aneurism.)

§ "It appears to me that the operation is accomplished with less disturbance to the parts covering the artery when the incision is made upon the inner margin

although they do not go quite so far, incline to similar sentiments. Without venturing to differ in opinion from such high authorities, I shall merely state, that disturbance or displacement of the sartorius muscle is not necessarily followed by the formation of sinuses. Thus in a case recorded by Pelletan,* "the incision was made over the anterior edge of the sartorius, which muscle was raised, and the cellular tissue connecting it with the subjacent parts ruptured by the finger," and yet no unpleasant consequence ensued. Mr. Hunter's operations were not always followed by the formation of sinuses;† and we must all have occasionally seen cases in which the margin of the sartorius was raised and detached to a greater or less extent with perfect impunity; nay more, some of the modern French writers counsel us not only to raise, but even to cut across this muscle, in certain cases, and do not appear to anticipate any unfavourable results from such practice.‡

Are there then any other causes by which the formation of such sinuses might be induced, or by which their cicatrization, supposing them to have formed, would be retarded or prevented? Any debilitating cause impairing the general power of the constitution may, in my opinion, contribute to such an effect. In this way a scrofulous or syphilitic diathesis, or the presence of any other considerable source of deterioration of health, whether general or local, may operate.

of the sartorius, and consequently the formation of sinuses is less likely to take place when the artery is exposed by raising that muscle."—Treatise on the Diseases of Arteries and Veins, p. 436.

* Clinique Chirurgicale, tome i. p. 180.

† Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. i. page 161-163.

‡ "On a vu pendant cette opération, pratiquée à la partie inférieure de la cuisse, le muscle couturier se contracter avec tant de force et gêner tellement le chirurgien, qu'il a fallu le couper en travers sur une sonde cannelée. Cette section n'a pas entravé la guérison complète du sujet."—Sabatier de la Méd. Opér. tome iii. page 215, nouvelle édition.

Of such a view of the question, the case which I have related offers an example. The man was naturally of a delicate, perhaps a scrofulous constitution, and there was a want of the *vis vitæ* about him from the beginning. Even so early as the fourth day from the operation, we find that there had been no union in the wound, and the discoloration of the outer ankle, so late as the tenth day, and after the circulation in the limb had been fully re-established, appeared to depend on a similar cause.

I cannot imagine that inflammation of the cellular tissue occurred, for at no period was there a distinct abscess or fluctuation, scarcely any discolouration of the skin, nor any discharge of shreds or sloughs ; but, even supposing that such inflammation and its consequences had taken place, I consider that it would have been extremely hazardous to have made the very deep incisions and counter-openings enjoined by Scarpa,* into the thigh of a patient so exhausted.

In conclusion I have to remark, that, although there can be little doubt that the discharge from the sinuses (no matter how produced) accelerated his death, still it appears by no means improbable, that the fatal event was immediately induced by *aortic aneurism*, (the existence of which disease, during life, the great Laennec himself was often unable to discover.†) In confirmation of such an opinion it may be recollected that the patient had a *vibratory pulse* on several occasions, and that, two days

* "On the appearance of this accident," (abscess from dead cellular substance,) "which is for the most part after the 20th day from the operation, it is absolutely necessary to make a counter-opening in the vicinity of the knee, in the direction of the superficial femoral artery, and if necessary, also between the lower heads of the gracilis and semi-membranosus muscles."—Wishart's Translation, p. 286, second edition.

† "Je ne sais trop encore après dix ans de recherches jusq' à quel point l'auscultation médiate pourra servir à établir le diagnostic des anévrismes de l'aorte."—*Traité de l'Auscultation Médiate*, tome ii. p. 723.

previous to his death, he complained of pain in the cardiac region accompanied by lividity of countenance, denoting obstruction to the venous circulation. I was at that time unacquainted with the value of auscultation.

In the performance of the operation I applied two ligatures, in order to insulate completely the portion of artery necessarily detached from its connexions, and thus to obviate one of the causes of secondary haemorrhage ; but thought it safer not to divide the vessel in the intermediate space, as was at that period very much the practice.*

CASE II.—*Diffused false Aneurism of the Popliteal Artery, arising from a Wound of that Vessel by the End of a Sequestrum from a necrosed Femur ; Scarpa's Operation ; Death from previous Exhaustion, and Gangrene.*

This case occurred in the course of last year to Dr. Byron, Surgeon to the Meath County Infirmary, who has permitted me to lay it before the Society. A young man, aged 25, apparently of a good habit of body, had laboured, for some years previously, under necrosis ; which affected the lower third of the right femur. There were two fistulous openings, one on each side of the thigh, about four inches above the joint ; these discharged moderately, the constitution sympathized but little, he was able to pursue his ordinary occupations as a labourer, and, in fact, the disease was progressing in a gradual manner to its natural termination in recovery.

Unfortunately for this poor fellow, a wedding took place in the neighbourhood, at which he was induced to engage in dancing ; feeling, no doubt, his necrosed thigh, though somewhat more clumsy, to be equally strong as the other. But, while in the full enjoyment of his amusement, he experienced a sudden uneasiness in the thigh, accompanied by a sensa-

* Abernethy's *Surgical Works*, vol. i. p. 250. Maunoir, *Mémoires Physiologiques et Pratiques sur l'Anévrisme et la Ligature des Artères*, p. 58.



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Fig. 1

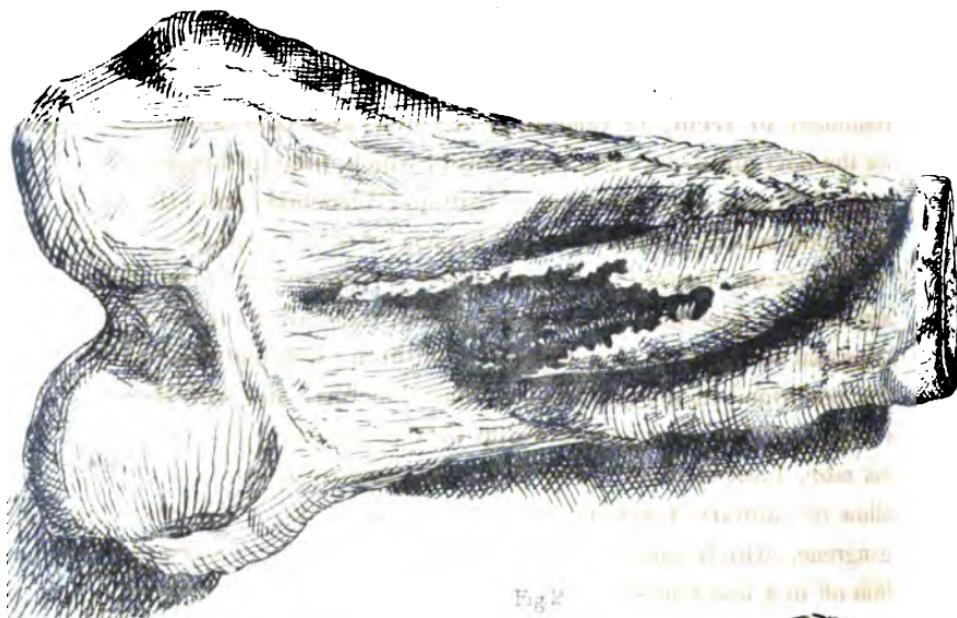
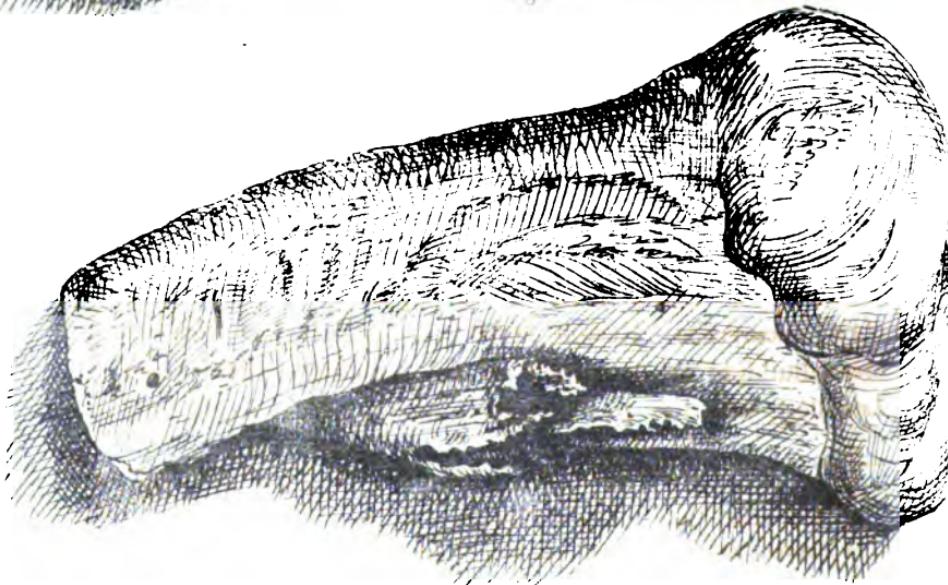


Fig. 2



tion of great weakness, and, on looking down, observed his trowsers to be stained with blood.

From that moment his sport was at an end, "his occupation gone." He was carried to an adjoining apartment, and, on stripping, observed blood issuing smartly from both the openings in his thigh. The haemorrhage was arrested, for the moment, by some domestic method of compression, but continued to recur, in quantities more or less considerable, for the next eight days; at the end of which time he applied at the Infirmary, his countenance pale and blanched, and arterial blood issuing, at the instant, from one or both openings.

Dr. Byron, finding that compression on the femoral artery arrested the bleeding, with great promptitude, decided upon tying that vessel in the upper third of the thigh; which operation was performed at the moment, without difficulty, and with the effect of putting an immediate stop to the haemorrhage. The *vis vitæ*, however, had been previously too far exhausted to allow of salutary reaction, and the limb passed rapidly into gangrene, which quickly extended to the groin, and carried him off in a few hours.

The *post mortem* examination discovered a longitudinal slit nearly one-fourth of an inch long, in the front of the popliteal artery, close to which lay a jagged portion of sequestrum; this was thin and sharp, and formed a part of half of the circumference of the cylinder of the old bone, the greater portion of which was firmly incased in the new one. The bones are well represented in the accompanying lithograph plate.

Cases analogous to the foregoing are, I am inclined to think, of rare occurrence. Russell, in his work on Necrosis,* does not even allude to the possibility of such an event; neither does Leveillé,† who has treated largely on the same subject: the

* A Practical Essay on a certain Disease of the Bones, termed Necrosis.

† Nouvelle Doctrine Chirurgicale, tome iv. p. 321.

older writers likewise are equally silent. I am enabled, however, to call the attention of the society to two other examples of the sort, one of which is recorded in a Thesis published by my friend Professor Jacob;* and the other has been detailed in a late number of the Dublin Medical Journal, by Mr. Porter.† But when we consider how frequently the end of the sequestrum tends to project backwards, how sharp its point usually is, and how forcibly it must, of necessity, compress and lacerate the soft parts, previously matted together by inflammation in such cases; we must feel surprise that the artery so often escapes injury.

The three cases appear to coincide in the following points: in the previous existence of disease in the bone for several years; in the time of life of the attack, (the patients were aged 19, 25, and 29 years;) in the similarity of situation of the wound in the artery; in the recurrence of the bleeding at comparatively long intervals; in the infiltration of the limbs; and in the exhaustion of the patients. In Dr. Jacob's case the wound was transverse, the vessel being nearly cut across; in the two others longitudinal. In Mr. Porter's case the sequestrum appears to have been loose, but in the two others it was so fixed in the old shaft, as, although moveable, not to admit of extraction from it, even after maceration.

In such instances, should we amputate the limb, or practise Scarpa's operation? Dr. Jacob's patient had amputation performed, and recovered; Dr. Byron's had the artery tied, and died of previous exhaustion, followed by gangrene; and Mr. Porter's, although presenting himself under very unfavourable circumstances, would probably have recovered had he permitted his limb to be removed. The limbs, too, were all more or less infiltrated with blood or serum, and more or less deformed;

* *Dissertatio Medico-Chirurgica, de Aneurismate, auctore Arturo Jacob.*
Edinburgh, 1814.

† *Dublin Journal of Medical and Chemical Science*, No. 14, p. 190.

and above all, the constitution had sympathized largely in all, and in two of them gangrene occurred.

Considering then these points, and that a certain degree of energy in the system appears to be necessary to enable the collateral vessels to become enlarged when the principal trunk has been tied, it would seem to be the most judicious practice to amputate in such cases; the fact being borne in mind, that you thereby at once rid the patient of a disease which, besides endangering his life at the moment, may likewise do so, if allowed to remain, by suppuration and other remote consequences at a future period.

But although wounds of blood vessels by the ragged ends of necrosed bones are seldom met with, there are accidents of a very analogous nature, of not unfrequent occurrence, and to which I consider it advisable to call the attention of the Society in this place; I mean those instances in which spiculae of bone, in either simple or compound fractures, wound occasionally the tibial, fibular, or (although more rarely*) femoral arteries.

In such compound (or rather complicated) fractures the line of practice appears to be well established, and consists either in cutting down upon the artery supposed to be wounded, and tying it above and below the place of injury, (occasionally removing portions of bone to facilitate such a proceeding,) or in applying compression by means of prepared sponge, agaric, &c. Of the first sort of practice we have examples in the works of Sir Astley Cooper,† Guthrie,‡ and Jean Louis Petit;§ and of

* Cooper's Lectures by Tyrrell, vol. i. p. 225.

† Lectures by Tyrrell, vol. iii. p. 200.

‡ A Treatise on the Diseases and Injuries of Arteries, p. 272.

§ "Ordinairement l'hémorragie n'arrive que dans les fractures avec plaie; cependant dans une fracture de la jambe sans plaie extérieure, j'ai vu l'artère qui passe entre les deux os, ouverte par le tranchant de la fracture du tibia qui étoit cassé en flûte. Il survint une équimose par toute la jambe et le pied; la partie devint froide et brune; on la croyoit gangrénée. J'ouvris la jambe, et ayant

the last, instances are recorded by White,* Gooch,† and others. I do not here speak of amputation as at all applicable to these injuries, but every surgeon is aware, that in certain cases, accompanied by great laceration of the muscles and disorganization of the soft parts, such a *question* must necessarily arise.

But when such injuries are unaccompanied by any breach of integument, surgeons seem to be undecided as to whether they should cut down immediately upon the wounded artery, (thereby converting a simple into a compound fracture,) or perform the operation of Hunter or of Scarpa.

The latter plan appears to me to be the most advisable, and is at least worthy of a trial, being preferable, on so many accounts, to the incision of the soft parts around the fracture; but it will not always succeed in checking the bleeding, although the probability of its power to do so may generally be inferred from the effect of pressure on the artery in the groin upon the pulsations or size of the swelling beneath.

An interesting example of the success of such an operation is given us by Pelletan, in which, instead of cutting down on the artery supposed to be wounded, Dupuytren, under Pelletan's direction, tied the artery at the middle third of the thigh. The particulars are the following: "A woman 60 years old, and of a weak constitution, was brought to the Hotel Dieu on the 3rd January, 1809, labouring under a simple fracture of both bones of the left leg, in consequence of a fall in the street the evening before. The bones were broken at the top of their inferior third, and the leg was much swelled, particularly behind,

commencé l'incision quatre travers de doigts au-dessus de la fracture, je la poussai quatre travers de doigts au-dessous. Je découvris l'ouverture du vaisseau; j'arrêtai l'hémorragie sans déplacer les os: je fis du reste le pansement qui convient aux fractures compliquées, et mon malade fut guéri dans l'espace du tems ordinaire."—*Traité des Maladies des Os*, tome i. p. 46.

* *Cases in Surgery*, p. 141.

† *Chirurgical Works*, vol. ii. p. 338; vol. iii. p. 107, new edition, London, 1792.

where the tumour reached the condyles of the tibia. When the limb was taken between both hands, a deep seated and very considerable pulsation was discoverable, which was at once arrested by pressure upon the femoral artery in the groin, proving the dependance of the swelling upon the rupture of an artery. The Hunterian operation was performed, with cessation of the pulsation and diminution of the swelling, at the moment of drawing the knot. The ligature separated on the twentieth day, along with two safety ligatures which had been placed above it; notwithstanding which, and her advanced age, this woman recovered perfectly in about six months.* But it is not always necessary to secure arteries which have been opened by the ends of fractured bones. Several examples are recorded of fractures of the femur and humerus accompanied by considerable bloody effusion, and ecchymoses extending to the axillæ and iliac regions respectively, which, nevertheless, have been followed by a gradual absorption of the fluid, and perfect recovery of the limbs.† The existence of pulsation in such tumours should be considered more than the actual size of the swellings themselves.

CASE III.—Circumscribed false Aneurism of the Brachial Artery; a high Bifurcation; both Branches tied; the Aneurismal Sac opened; Recovery.

Patrick Gahagan, a shoemaker, 32 years of age, of middle stature, and sound constitution, was admitted into the County of Meath Infirmary on the 28th of December, 1824. He stated that four days previously, whilst sitting at his work, a hen flew up in his face; (an occurrence, I may observe, of very unfavourable augury amongst our peasantry;) he started up in a passion, and made a blow at the bird with a stick which lay

* Clinique Chirurgicale, tome i. p. 180; see likewise a similar case in Delpech, Chirurgie Clinique, p. 38.

† Pelletan, Clinique Chirurgicale, tome ii. page 135.

near, and which he had suddenly seized, forgetting that he held at the moment the paring knife used in his trade, in the left hand.

The object of his vengeance being towards the left side, it so happened, that in making a blow at it with great force, he struck the inner side of the right arm upon the point of the paring knife, thereby wounding the brachial artery. An instantaneous and violent effusion of blood took place, which was stopped by compression. Forty-eight hours afterwards, on removing his bandages, the bleeding recurred with similar violence, but was, a second time, arrested by stitching the wound closely and reapplying the pressure.

On examination he was found to have received an incised wound on the inner side of the arm, two inches above the inner condyle, and one inch superior to the bend of the joint. This wound was an inch and a half long, and extended obliquely upwards and outwards; its surface was foul, but partially united, and its edges had been closed by four continuous sutures. To the outside of the wound was situated an aneurism half the size of a pigeon's egg, pulsating strongly and synchronously with the artery at the wrist; and the arm and forearm were swelled to at least twice their usual size, particularly on the fore and inner parts.

His general health appeared to be good, and his constitution robust; his tongue was moist and clean; his bowels open from medicine; the pulse 100, weak and somewhat irregular; and he slept ill from mental uneasiness. The sutures were removed and the wound closed by adhesive plaster.

The Acetate of Lead lotion was applied to the limb, alterative doses of Mercurials with occasional Purgatives were directed; with 35 drops of Tincture of Opium at night, and Low Diet.

January 3rd, 1825. Bowels open; pulse 72; slept well; swelling diminished one third; wound tedious.

Applicatur Nitrás Argenti; Omittr. Haustus; Contr. Cætera.

Middle Diet.

January 8th. Wound healed ; swelling of forearm gone, that of arm three-fourths lessened ; aneurism stationary, its pulsations ceased when the brachial artery was pressed against the humerus at the centre of the arm ; pulse 72. Gentle pressure was directed to be applied over the aneurism by means of a compress of lint, secured by a roller round the arm and forearm.

Omittr. Lotio Plumbi ; Contr. Cætera.

January 12th. Swelling of the arm gone ; pulsations of the aneurism less strong. Allowed to get up.

January 19th. Skin over the aneurism had vesicated ; the tumour had not increased ; pulse 80, moderate. Pressure to be lessened.

Ung. Simplex.

January 22nd. Two days before, from increased irritation of the skin, the pressure over the aneurism was discontinued, and applied on the artery above it. The pulsations appeared for some time to have become weaker in the tumour, but were then more considerable, and the tumour itself had also become larger. Pulse 72.

January 26th. Pulsations in the aneurism very feeble, and the size of the tumour stationary ; a small portion of integument on its surface was separating. Pulse 72.

January 28th. Arm uneasy in the night. It was found that the slough had separated, leaving the aneurismal sac exposed, from which a small coagulum projected. Pulse 72.

Cataplasma Com.. Tourniquet round the limb.

January 29th. At one o'clock, A. M., whilst making an exertion, the coagulum which filled the mouth of the sac came away, and a small discharge of arterial blood immediately followed, the farther issue of which was prevented by tightening the tourniquet. His pulse was 80, and weak, and he appeared alarmed.

At six o'clock, P. M., seventeen hours afterwards, a larger

clot was suddenly expelled, accompanied by a profuse discharge of arterial blood, "per saltum." The tourniquet was tightened, and arrested the haemorrhage after he had lost four ounces of blood.

At that moment the following condition of parts existed: the cavity of the aneurismal sac was exposed by an opening the size of a shilling, the sac itself being apparently as large as a common sized poppy head; there was considerable hardness and thickening of parts in the line of the brachial artery, extending up the arm for one hand's breadth above the sac; no pulsation was discoverable at the wrist, and the limb retained its natural temperature.

The tourniquet having been placed as high as the fold of the pectoral muscle would admit, an incision was made from the edge of its strap to the termination of the hardness before noticed. This incision occupied the central third of the arm, and was about three inches long.

Cautious dissection brought successively into view the brachial vein, ulnar and cutaneous nerves, brachial artery, and *venæ comites*. The artery was separated with facility from its attachments, and raised on the point of an aneurism needle; some doubt having arisen as to the identity of that vessel, the tourniquet was slackened, and the pulsation being discoverable below the needle, the artery was tied with a double ligature. On loosening the tourniquet the haemorrhage recurred from the sac with unabated violence. A high bifurcation existed at the point where the vessel had been tied, and it was then deemed proper to include the second trunk in a ligature; which was accordingly done easily, but without any effect in checking the haemorrhage.

The discharge of arterial blood having been altogether uninfluenced by these measures, it was determined to incise below the sac, and endeavour to tie one or both branches of the bifurcation, as might be found necessary. Accordingly, an oblique incision was made on the inner side of the arm,

immediately below the sac, carried outwards two inches, and subsequently made angular, by giving it a direction towards the biceps tendon. The veins and nerves were exposed, and the artery sought for without success, and in the course of these efforts the sac was opened below.

During the continuance of the recent operation, the tourniquet had been occasionally loosened, as the size of the opening in the sac enabled the thumb, assisted by a compress of lint, to command the bleeding; it was then, however, tightened, and the finger passed into the sac. That cavity was found to be of an extent considerably larger than had been supposed; it extended two inches in the direction of the external hardness, and three inches to the outside of the biceps tendon; altogether it might contain four ounces of coagula.

As the sac had been exposed, and the second opening made into it, and as there seemed no prospect of finding the wounded vessel below, it was deemed right to throw both wounds into one by a suitable incision. This having been done, the brachial artery was discovered lying at the bottom and middle part of the sac, and in its centre was an opening or slit, half an inch in length, extending longitudinally, from which blood issued with the same freedom as before on the tourniquet being relaxed.

The artery was considerably enlarged, nearly to twice the usual size, and its coats much thickened, particularly superior to the opening which had been made into it; inferior to this aperture its condition was more healthy, and one inch below it its state was altogether normal. At that point, therefore, (a little dissection being previously required to bring it into view,) a double ligature was applied upon it.

This measure, though it materially checked, did not arrest the haemorrhage, for an oozing of florid blood still continued from the opening in the artery on relaxing the tourniquet. It was deemed prudent, therefore, to include the thickened portion of the vessel lying in the sac in a ligature, which was

accordingly done, two inches superior to the opening in it, and then only did the bleeding cease.

The sac did not extend quite an inch below the wound in the artery, although it reached more than three inches above it; its orifice was lightly filled with charpie, and the other wounds were brought together by adhesive plaster. Compresses of lint and tow, with a flannel roller, were applied over all, after which he was put to bed, and got thirty drops of tincture of opium, being directed to keep quiet and lie low. He bore the operation well, though much alarmed, and did not lose altogether more than four ounces of blood.

2nd Day. Had slept well; felt his arm easy, and the fingers were equally warm with those of the other hand. Pulse 120, moderate; tongue clean; bowels confined.

Opening medicine.

3rd Day. Bowels open; had slept little from heat of skin, which was followed by perspiration. Pulse 100, rather weak; tongue moist and clean. Two-thirds of the upper wound had united at the inferior part, and there was a slight purulent discharge from the neighbourhood of the ligatures. The lower wound had entirely united, there had been no discharge from the sac, and the swelling was moderate. The limb retained its natural temperature.

Diaphoretics. Alteratives. Purgatives.

5th Day. Bowels open; pulse 100, moderate; tongue clean. A restless night from general uneasiness. Wounds healing; surface of the exposed sac granulating; temperature of the axillæ of both limbs 98, in the sound hand 93, in that of the aneurismal limb 95.

Contr. Remedia.

8th Day. Bowels open; pulse 80, weak; temperature of axillæ and palms 98. Feeble pulsation in the right radial artery at the wrist. Upper wound healed, except around the

ligatures; lower wound cicatrizing rapidly, and the entire sac was granulating.

Omitr. Mist. Diaphoretic. Contr. Gaetera. Middle Diet.

12th Day. All the ligatures came away spontaneously. Pulsation of the right radial artery half as strong as of the left. The lower wound was quite superficial, and the cavity of the sac appeared to have been obliterated.

Allowed to sit up and have full diet.

15th Day. Slight pulsation in the right ulnar artery; limb considerably emaciated; was able to flex the wrist and elbow joints slightly, and also to raise the shoulder a little, but in other respects the member was useless to him.

17th Day. Pulsations of the right wrist nearly as strong as those of the left; could flex the elbow to a right angle, and its powers were in every respect increased; the limb was less wasted. Was allowed to get up.

23rd Day. Pulse 88, and weak; bowels regular; wounds languid.

Applicr. Nitras Argenti. Decect. Cinch. c. Acid.

43rd Day. The wounds were all healed. The hand was oedematous, and the powers of the fingers not quite restored. His pulse but 60, and moderate.

He was directed to have Liniment. Ammoniæ, to lay aside his flannel roller, and to use the limb freely.

47th Day. The limb was only a quarter of an inch less in circumference than the corresponding member, and he possessed nearly the full use of it. A strong pulsation was discoverable in the profunda superior, and he was discharged cured.

When the several circumstances attending the case which I have just related, are considered, it will be acknowledged, I apprehend, that a more embarrassing and difficult duty, than fell to my lot to discharge on that occasion, could scarcely de-

volve upon any surgeon. A delicate operation was required to be performed by candle light; my assistants were so uninformed as to be of little use to me; and several untoward and unusual occurrences took place, in which, having no precedent to direct me, I was left entirely to the resources of my own judgment.

The case altogether presents us with an excellent example of the *quid natura faciat aut ferat*; and were similar occurrences more usual, it would have been quite unnecessary for the late Mr. John Bell and other distinguished surgeons to have expatiated, in the eloquent language employed by the first named gentleman in his excellent work on Wounds,* upon the resources of nature in enlarging the inosculating arteries around joints, when the main artery of a limb has been tied or otherwise obliterated.

When we reflect upon the opinion entertained by most of the older pathologists, that it was only in cases of unusual distribution of the vessels of the upper and lower extremities (i. e. when there were two main trunks in place of one) that the ligature of either the femoral or humeral artery (when required in consequence of a wound or an aneurism) could be attempted with any prospect of success; the proposal to tie up both such trunks at the same moment appears at first somewhat startling, and would have been regarded by our forefathers as little short of madness. Calm reflection, however, will convince us that such an operation may be performed, not only without risk, but with manifest advantage, as I flatter myself was done in the present case. We all know that these high bifurcations of the humeral artery are by no means unfrequent; and I believe we have never found the inosculating arteries around the elbow joint of a smaller size in the arms of individuals so circumstanced, than in others where the distribution was more regular. The facility with which the circulation became re-established in the case before us, confirms such an opinion. The limb ne-

* *Discourses on the Nature and Cure of Wounds*, pp. 41, 69.

ver lost its heat, the pulsation in the radial artery was restored on the 7th day, and in the ulnar artery on the 14th; and, at the period of his dismissal, on the 16th March, the 46th day from the operation, the pulsations of the profunda major were unusually strong, and that artery perhaps more enlarged than it generally is after the ordinary operations of the kind.

As far as I know, *there is no recorded instance of such an operation*, and the possible occurrence of a case, where a proceeding of that nature might become necessary, is noticed in rather a vague manner by most authors.* But from this observation I must except the accurate and learned Scarpa, who alludes to the arrival of such a contingency, in the following trite passage: "In a case of wound or aneurism in the bend of the arm in a patient with such a conformation, where the radial and ulnar arteries run on the inside of the humerus, parallel and contiguous to each other, it might very readily happen that the surgeon, in performing the operation, would include both arteries in the ligature. The mistake indeed would not be of great

* Mr. Liston says, "But it must be recollect that high division of the humeral is not uncommon, and, before casting the knots, pressure should be made on the vessel with the finger against the loop of the ligature, and the effects on the tumour watched; if pulsation cease, and the tumour become flaccid, the ligature should be secured; but if no effect is produced on the swelling, high division is demonstrated, and the other branch must be looked for."—Elements of Surgery, vol ii. page 307. From this passage it would appear, either that Mr. Liston was not aware of the frequent communication between the two bifurcating vessels by means of a large cross branch, or, that he wished, at least, the experiment to be made whether pressure on either of the main trunks would arrest the pulsation in the tumour, previous to resorting to the operation of tying both. Mr. Harrison's language is much more decided and practical. "Should (says he) two arteries be exposed in consequence of a high division, the operator should endeavour to ascertain, by pressure, which vessel communicates with the wound or aneurismal sac, and apply the ligature accordingly; but if the pulsation cease, only, when both vessels are compressed, he will be justified in tying both, as he may then conclude that these arteries communicate with each other above the seat of disease or injury."—Surgical Anatomy of the Arteries, vol. i. p. 166.

consequence, since, according to all the calculations, the ligature of these two arteries in the bend of the arm, or even higher up, would not produce consequences different from those which the ligature of the single and principal trunk of the brachial artery produces above the division of the radial and ulnar arteries. For, in the former, as well as in the latter case, the passage of the blood would remain equally open by the profunda humeral and two collateral arteries to the anastomoses, formed by the recurrent arteries of the elbow. However, we must allow that it would render the operation more complete to avoid in similar cases the tying of both these arteries, as it is only necessary to tie the one which has been wounded."*

The truth of Scarpa's remarks on the subject is incontestable, provided it be the old operation for aneurism (and that which was eventually performed on our patient) which it is intended to practise; but does not justly apply to that more generally in use. For, supposing that I had succeeded in my attempt to tie the artery inferior to the sac, having previously included in a ligature either of the branches of the high bifurcation; the haemorrhage, so far from being stopped, most probably would have continued with unabated force, there being, very usually, a free communication by means of a cross branch situated near the tendon of the biceps, between the two divisions of the bifurcation.† I am of opinion, therefore, that the operation was not only perfectly justifiable upon sound physiological principles, but imperiously demanded by the imminent danger in which the patient was placed.

Suppose, for an instant, that I had been satisfied with a simple ligature upon one of the branches of the bifurcation, (perhaps forgetting that there might possibly be another), and had

* Wishart's Translation, p. 392, second edition.

† In five, out of ten specimens which I examined, this variety existed; the branch was usually about half the calibre of the parent trunks, running sometimes behind, sometimes in front of the tendon of the biceps muscle.

plugged up the sac with charpie, a practice answerable to the views of some practitioners!* what would have been the result? repeated secondary haemorrhage, necessitating either a farther operation, when the limb had become infiltrated, or perhaps requiring amputation when the energies of the patient had been so far exhausted, as to give him little chance of surviving its effects.

Such cases are not imaginary, to prove which, take the following example from the practice of one of the first surgeons in the world, as recorded in Sabatier's *Médécine Operatoire*.† M. G., 25 years of age, had the brachial artery wounded in bleeding. Compression was tried with but a momentary effect; after which the artery was tied with one ligature. The haemorrhage, however, soon returned, and the arm was amputated!‡ Mr. Guthrie, also, in his late excellent work, records many similar occurrences.§

I am aware that many distinguished surgeons advocate the performance of the old operation in cases of aneurism at the bend of the arm arising from wounds;|| and perhaps, consider-

* See such a case followed by death in Pelletan, *Clinique Chirurgicale*, tome ii. p. 5.

† Tome iii. p. 188.

‡ Here we must presume that the infiltrated condition of the soft parts prevented an attempt to secure the lower end of the artery, for, we cannot imagine that in modern times any surgeon would perform amputation for a mere wound in a large blood vessel.

§ Speaking of the propriety of tying both ends of a wounded artery he says, "this practice would be seldom followed by any bad or unfavourable result, if it were immediately adopted; but as the error is usually made by persons incompetent to the performance of the operation, the bleeding is, in the first instance, restrained by pressure, until repeated recurrences of it render the operation necessary. The arm is then, in all probability, more or less injected with blood, inflammation has taken place, the constitution can scarcely have failed to sympathize, and the operation, under these circumstances, is frequently ineffectual; amputation follows and death."—Treatise on the Diseases and Injuries of Arteries, p. 331.

|| In this situation the old operation is preferable to the modern one, because

ing that the sac had been already opened, most persons would have preferred that method in the present instance. But it is also to be remembered, that very high authorities hold sentiments directly opposite. Thus one eminent practitioner informs us, that in all his operations on the brachial artery, after injury in venesection, "he never found it necessary to open the aneurismal sac, or to look for the vessel below the tumour, or to apply more than one ligature around the artery;"* a second, while recommending a similar line of practice, says, "it is better not to make an incision upon the artery at the elbow joint, as most important parts are divided, and constitutional irritation runs so high as to occasion the destruction of life;"† and a third, in detailing the particulars of an operation upon the humeral artery, wounded seventeen days before, says, "I did not trouble myself with tying the artery below the ulcer, both because I would have been unable to distinguish the artery in that intricate mass of substance adhering together, and because I was persuaded that the blood which flowed back from that part might be stopped by a moderate compression, which in fact took place."‡ A practical surgeon of great experience unites the new and old operations in such cases, both opening the sac and tying the artery at the middle of the arm.§

it affords the easiest access to the artery, and in cases of its high division saves the surgeon from the risk of tying the wrong vessel; because there is no reason to apprehend degeneration of its coats in the neighbourhood of the disease, as the aperture resulted entirely from violence; and also because simple ligature of the artery higher up than the tumour has proved unsuccessful, owing to the free anastomoses of the branches distributed to the elbow."—Syme, *Principles of Surgery*, p. 148. See also Guthrie, *Op. citat.* pp. 272, 331.

* Colles, in *Harrison's Surgical Anatomy of the Arteries*, vol. i. p. 770.

† Sir A. Cooper's *Lectures by Tyrrell*, vol. ii. p. 84, in which a case is given of death following such an operation on the fourth day, where the sac had been opened, and the artery tied above and below the opening in it after venesection.

‡ Wishart's *Translation of Scarpa on Aneurism*, p. 473. Second edition.

§ Larrey, *Mémoires de Chirurgie Militaire*, tome iv. p. 360.

It is perhaps to be regretted that I did not combine the practice of Valsalva, at the period in which I employed compression, with the use of digitalis in large doses, as recommended and practised with success in the interesting cases reported by Mr. Campbell in a late number of our medical periodical;* more particularly as there appeared some tendency in the aneurism to obliterate itself at one time: but I had then little confidence in the efficacy of such measures, and besides, the tumour soon became too tender to allow of a perseverance in the use of bandages.

I might enter much farther into those details which the peculiarity in the circumstances of the case before us could not fail to afford me; but, as I have detained the Society so long, I proceed to the fourth and last case in my list, not less interesting, in some points of view, than any of the others.

CASE IV.—Aneurismal Varix at the Bend of the Arm; rapid and unexpected Cure from the Application of a Bandage, without Obliteration of either Artery or Vein.

Patrick Campbell, a labourer, of middle size, and healthy appearance, was admitted into Saint Mark's Hospital on the 29th March, 1830, for aneurismal varix of the left arm.

The median basilic vein was dilated to about the same extent as we observe it to be when ordinary venesection is going to be performed; and the pulsations of the artery beneath it, accompanied by the peculiar thrilling sensation, resembling the noise produced by the wheel of a watermill, were distinctly and strongly perceptible both to the ear and to the touch. This thrill extended for at least an inch all round the site of the original puncture, and could be removed by moderate pressure on the vein, without the pulse at the wrist being interrupted.

Slight hardness existed in the situation of the wound in the artery, particularly towards its outer side, accompanied by yel-

* Dublin Journal of Medical and Chemical Science, vol. i. p. 117.

lowness of the skin along the inside of the arm ; and the forearm could not be flexed beyond a right angle, nor extended perfectly. His pulse was 80, and moderate ; his tongue loaded, and the bowels confined.

He stated, that six days previously he had been bled in the median basilic vein, for a slight pulmonary attack. The vein had been punctured towards the centre, and the orifice was not unusually large. About six ounces of blood were taken, which flowed "per saltum," its discharge being easily checked. The next day the inner side of the arm, for four inches above and below the elbow, was ecchymosed and yellow, and a small pulsatory tumour was observed under the orifice. Three days ago this orifice healed, and the symptoms have since made little progress.

A compress of lint, wet with *Lotio Plumbi Acetatis*, was applied over the tumour, which was kept in its place by a roller, carried round the forearm and elbow ; and some ordinary purgatives were directed.

March 30th. Bowels open ; thrilling sensation entirely gone, and the vein restored to its ordinary size before the accident. Pulse 76, full ; unusual pulsations in the cardiac and inguinal regions.

Venesectio ad 3xviii. Purgatives to be repeated. Bandage and Lotion to be continued.

March 31st. Blood not inflamed ; pulse 72, soft. There was then no apparent tumour, but the artery pulsated more strongly than that on the opposite side.

Directed to take ten drops of *Tincture of Digitalis* three times a day, and to continue the other remedies.

April 8th. Ecchymosis and yellowness of the skin nearly gone. More pulsation in the sound arm than in the injured one, and scarcely any hardness about the artery. Pulse 72, moderate.

Augr. Tinctura Digitalis ad Guttas xv. ter die. Omittr. *Lotio Plumbi.* Continue Bandage. Alterative Aperients.

April 12th. The arm was in a natural state, the vein of its usual size, and the artery felt beating beneath it, without increased strength in its pulsations, or any surrounding hardness. He was discharged cured.

Aneurismal varix, at the bend of the arm, according to the opinions of the most approved authors, usually progresses in three several ways, viz.: 1st, in the majority of instances the tumour, after attaining a certain moderate size, remains stationary, and, with ordinary care, and the avoidance of unusual exertion of the member, continues to be free from either danger or inconvenience during the rest of life.* 2dly. Either from over exertion or improper treatment, the cicatrix formed between the wounded artery and vein gives way, blood is effused into the intermediate and surrounding cellular tissue, and a varicose aneurism is eventually produced.† 3dly. By careful and gradual compression, more particularly in young subjects, adheave inflammation may be excited, by which the orifice of communication between the artery and vein becomes closed, the varicose swelling removed, and one or both of these vessels obliterated at the place; most usually the vein, but often both vein and artery.‡

Few surgical practitioners, however, are aware, I believe, of the fact, that an aneurismal varix may be radically and perfectly removed, all the tissues concerned in its production being restored to their original integrity, as occurred in the case which I have detailed.§

* Dr. Hunter, in the *Medical Observations and Inquiries*, vol. ii. page 393.

Dr. Cleghorn, in same, vol. iii. page 110. Mr. White, in same, vol. iv. page 179, &c. &c.

† Guthrie, op. citat. page 334. Hodgson, page 507. Scarpa, page 433.

‡ Burns' *Principles of Surgery*, vol. i. page 483. Sir A. Cooper's *Lectures*, vol. ii. page 86. Scarpa, pages 360, 431. Hodgson, page 505, &c.

§ Burns however says, "even the vein may remain pervious, but more frequently its tube is obliterated at the spot, and forms a solid covering for the artery."—*Principles of Surgery*, vol. i. page 483.

But a termination so favourable must be deemed a rare event, and to account for it we must presume, that just so much lymph was effused as sufficed to agglutinate the lips of the wound in the artery, without being secreted in a quantity great enough to endanger the obliteration of its canal.

That the gentle pressure of the roller contributed to this effect is probable; but we must not forget that such an agent has been reprobated by authors, as giving rise, on several occasions, to the second termination of the disease which I have noticed, namely, the formation of a varicose aneurism;* it should therefore be used cautiously, and its effects carefully watched.

The venesection and digitalis were employed with a view of diminishing the force of the circulation, so as to render the separation of the recently united wound between the vein and artery less likely to occur.

ART. VII.—*An Account of Hydatids found in the Omentum of an Axis Deer; with Observations on their Pathological Changes: illustrated by an Engraving.* By JOHN HOU-
STON, M. D. M. R. I. A., Demonstrator of Anatomy, and Curator of the Museum of the Royal College of Surgeons in Ireland. Surgeon to the City of Dublin Hospital, &c. &c.

[Communicated to the Medical Section of the British Association, but omitted in our Report of the Proceedings of that Section, given in the last Number of this Journal.]

THE great interest which has of late years attached to investigations respecting parasitical animals, encourages me in bringing

* “ A bandage, employed with the view of preventing the basilic vein receiving the blood, which is sent into it from the humeral artery by the unnatural anastomosis, might cause the arterial blood to infiltrate into the cellular substance lying between the artery and the vein, and produce a disease worse than the first, viz. an aneurism.”—Scarpa on Aneurism, Wishart's Translation, page 427.

forward some observations on a variety of hydatid, termed *cysticerous tenuicollis*, found by me in the omentum of an axis deer, which died in the Zoological Gardens at Dublin.*

On opening the abdomen of the animal, bunches of soft tumours presented themselves, hanging pendulous from the omentum. Similar tumours were found, after a little farther search, in the folds of peritoneum attaching the spleen to the stomach, and also about the ligaments of the bladder; but none such existed in connexion with those parts of the membrane forming the mesentery, or those covering directly any of the viscera in the cavity; neither were any such discoverable in the parenchymatous structure of these viscera. The tumours were of various sizes, from a pea to an orange, and somewhat flattened. They were all located in loose folds of peritoneum formed by the apposition of two layers, and exhibited different degrees of suspension. Some hung down by narrow pedunculated necks; some were held loosely in their places by broad points of attachment; and others were so disposed as merely to exhibit a projection equally obvious on both surfaces of the omentum. In general, however, they were more prominent on that surface looking forwards to the abdominal parietes, than on that in contact with the viscera. When the peritoneum was stripped off any of the more perfect of these rounded bodies, an operation easily accomplished, as the connexion was only by loose reticu-

* The animal died of disease of the lungs. These organs were universally studded with tubercles of various sizes, filled with soft curdy matter, which escaped readily under pressure, leaving behind smooth, vascular cysts. The lungs appear to have become incapable of supporting life from the enormous accumulation of small tubercles, and not, as occurs generally in the human body, from the coalition of those morbid growths, and their conversion into large suppurating cavities. In some places recent adhesions had cemented the surface of the lungs to the pleura parietalis. The commencement of the disease in the lungs was, I am disposed to think, of a more recent date than that at which the hydatids made their first appearance in the omentum; and most probably the two affections were altogether independent of each other, both in cause and effect.

lar tissue, a capsule presented itself, composed of flattened, white, fibrous bands, (see Plate, Fig. 1,) interlacing and joining with each other, so as to leave between them small, translucent intervals. This capsule did not appear filled to the full extent of its capacity; and when pinched up between the finger and thumb felt as if holding within it another detached bag, of more delicate organization. On making an incision into any part of the outer tunic, and exerting on it a gentle pressure, that inside dropped out, without sustaining any injury by the separation. Of the two structures, the latter was the *cysticercus*; the former the cyst or apartment, which had been developed for its habitation. The exterior surface of the hydatid was everywhere in contact with the interior of the cyst, but without any actual point of adhesion, as both surfaces were lubricated with a fine serous exhalation, in quantity, however, barely sufficient to preserve them in a moistened state.

As these parasitical animals have been already frequently the subject of research and controversy, I shall only speak of their zoological characters as far as the investigations I have been enabled to make tend to confirm or refute the observations of other writers, and place the nature of the animal in its true light.

Naturalists recognize in the *cysticercus tenuicollis*, a *head*, *neck*, *body*, and *caudal vesicle*. The *head*, in the largest specimens, is not bigger than a millet seed. It appears to the naked eye little more than a transparent vesicle, but when inspected through a magnifying glass (see Fig. 2,) is found to be complex in its organization and arrangement. It is truncated anteriorly, where it terminates in a circular transparent plane, the rim or outer border of which is of a more opaque character, and armed with a double row of horn-like, sharp-pointed, retroverted ciliae, in number, as far as I could count, about twenty. Behind the attachment of the ciliae the head enlarges for a short distance, and at the widest part presents four smooth depressions, arranged circularly, and at equal distances from

each other, around the transverse axis. These depressions are called mouths, meaning thereby patentous orifices; but, from my own observations, I believe them to be covered over by the same kind of transparent membrane as that which completes the anterior plane, for I had abundant opportunities of remarking that the fluid of the caudal vesicle, when squeezed along the neck into the head, protruded, and rendered them prominent without making its escape from apertures in their centre. Indeed to such an extent did this yielding of the structures of the head take place, that the anterior plane was rendered convex, and the part immediately adjoining it elongated into a sort of cylindrical proboscis, before giving way to the pressure from within. The representation given in fig. 2 is taken from an hydatid with the head distended after this fashion.

Behind the lateral mouths, the head suddenly narrows, and terminates by giving attachment to the neck. This part of the worm is about one line and half in length, (Fig. 2 magnified,) as small as the finest silk, and narrowest about the centre. It is composed of bundles of circular fibres, like rings, closely approximated. It is tubular, as shown by the transmission which it affords to fluids squeezed from the vesicle in the direction of the head,—an experiment which may be practised satisfactorily while the parts are lying under the field of the microscope.

The *body* (Fig. 2) varies in size; it is pyramidal, nearly half an inch long, pointed anteriorly, and about a line in diameter at its junction with the caudal vesicle. It is firm, opaque, and white; striking the eye at first sight as a distinct part of the animal. It is composed of circular fibres, arranged like those of the neck, and giving to the animal a jointed appearance like that observable in the common earth-worm. Pressure on the fluid contents of the caudal vesicle produces no apparent enlargement in the bulk of the body, the thickness of the structures of this part being such as to leave little cavity in its interior.

The *caudal vesicle*, (Fig. 2,) the largest and most conspi-

cuous part of the little animal, varies, in different individuals, from the size of an almond to that of a middling orange. I was not able to discover any at an earlier stage of their growth. In some the vesicle is nearly round; in others it bears more the shape of a leech. When looked at in a particular light, with a common lens, fibres are discernible running parallel to the transverse axis of the cavity. Its contents, which suffice in no instance to fill more than half the bag, are nearly transparent, and consist, according to an analysis of Dr. Apjohn, of water, a large proportion of albumen, and some salts. The tenacity and strength of the textures of the hydatid are such as to admit of its being lifted by the extremity, supporting the weight of the fluid within, without bursting. Several whitish, zig-zag lines, with lateral ramifications, like vessels, run backwards from the body, and are imperceptibly lost towards the posterior extremity of the caudal vesicle.

In every perfect specimen examined by me, the head, neck, and part of the body were out of sight: they had undergone a complete inversion, leaving little more in view, in most instances, than a white ring,—a part of the posterior extremity of the body,—with a circular depression in the extremity. (See Fig. 3.) In some even the whole body had disappeared, and hid itself in the cavity of the caudal vesicle. By squeezing forwards the fluid contents of the vesicle, and pressing on the body with the finger-nail, or the handle of a knife, the inversion was removed, and the anterior part of the body, and in some instances the head and neck also, were brought into view; but the full exposition of all these parts, by such manipulations, was difficult and unsatisfactory. Neither was the plan of immersing the hydatids in tepid water, as recommended, more successful, in my hands, in causing a protrusion of the head, as accidentally they had been all immersed in spirits before the experiment was resorted to. I discovered, however, some hydatids, to be hereafter described, which appear to have died some time previously to the death of the parent animal, but without having undergone any decom-

position, in which the inversion above alluded to had ceased to exist, and in which all the parts of the worm lay naked and exposed. In the examination of these I received a full corroboration of the accuracy of the above description, and which I acknowledge I could not have otherwise put forward with so much confidence, apprehensive lest by the means resorted to, in the other instances, for the extraction of the head and neck from the interior of the body, these parts might have been too much deranged and disfigured for yielding a view of them which could be relied upon.

The head of the *cysticercus tenuicollis* would appear to be the least important part of the animal. The term head, if applied to it in the sense in which it is commonly used, viz. as the agent by which the materials for the nutrition and growth of the individual are taken into the system, or as one for securing an attachment to surrounding objects, is, I think, altogether misplaced. For, independently of its diminutive size, and the questionable character of the lateral depressions to which the term mouths is applied,—questionable, inasmuch as some have even hesitated to admit their existence at all; and as, according to my own view of them, already stated, it would appear that they are closed over by a membranous expansion,—there are, in addition, good reasons for believing, that this part of the animal is not usually, in the living state, in a predicament for coming in contact with exterior objects, or of acting on them as an organ of imbibition or of prehension. I believe that the inversion of the body and head, observable in all the specimens, is the usual condition in the living state, and not, as described by writers, a state into which it passes during or after death,—“*retracté apres la mort.*” For during the attempts at dislodging the body and head by pressure, as described, strings and flakes of a whitish matter, like inspissated mucus, were pushed out and liberated. Some of the by-standers were at first disposed to look upon the white matter coming out of the extremity of the body during the experiment of evolution, as the head of the

cysticercus making its first appearance ; but as soon as the white matter became detached, and floated off in the water under which the experiment was made, and that the transparent head subsequently showed itself, all doubts on the nature of the fact witnessed were abandoned. The stringy matter was mucus, inspissated by long confinement,—a state of things of which we have examples, even in the human body, wherever a surface, which should be naturally exposed, is placed under such circumstances, that its usual secretions have not a ready outlet for their escape. I know of no other explanation of the fact which I have been endeavouring to describe ; and if it be admitted as correct, the conclusion cannot be resisted, that the inversion of the heads and bodies of these animals must be a natural condition, of long standing, and not, as supposed, the result of sickness and of death.

In farther corroboration of this view of the matter, it may be observed, that, even from the accounts of those writers who maintain an opposite opinion, proofs may be gathered that the death of the hydatid is not the cause of retraction of its head ; for, if such be the case, why does it become necessary to subject the worm to some process likely to deprive it of life, such as immersion in hot water, or the like, in order to bring the head out of its hiding place, for the purpose of subjecting it to microscopic observations ? Death appears, even from this experiment alone, to be a cause of protrusion and not of retraction of this part of the animal ; and this view of the subject is still farther borne out by the fact, that all those specimens in the case before us which had undergone a natural death, during the life-time of the animal whose body they inhabited, lay with their heads and necks protruded, whilst all those which retained life until after the decease of the parent animal, exhibited the opposite condition. This is a circumstance which has not hitherto, I believe, arrested the attention of helminthologists ; I mean the fact of natural death, if it may be so called, in the hydatid, being always attended with a protruded condition of the head.

The tapeworm has, no doubt, at one extremity an organ called the head, in which there are five depressions like those on the head of the cysticercus; but, nevertheless, the tapeworm possesses powers of growth, generation and locomotion independently of this so called head—the most diminutive part of its long jointed body. The leech, likewise, owes perhaps little to its teeth and sucking mouth for the accomplishment of its growth: the animal can live and move as well without as with them. I have had in my possession, and there is now preserved in the museum of the Royal College of Surgeons in Dublin, the posterior half of a leech which lived, and moved, and grew big for a period of nine months, after being torn by violence from the anterior half, in the act of emptying the animal of blood which it had sucked in, and after the wound of its lacerated body was so cicatrized as to leave no aperture into the stomach. The sucker of its tail served as the medium of attachment to some neighbouring object, and the exterior surface of its body acted as the agent for the imbibition of nutriment.

Lastly, the acephalocysts or echinococci, which are completely devoid of any organ of this description, nevertheless grow, and generate young, and preserve the plenitude of their caudal vesicles, which are exactly alike in structure and contents to those of the cysticerci.

For reasons of this nature we may be justified in considering that the part of the cysticercus called the head does not either serve as an organ for the imbibition of nutriment, or as a medium of connexion with exterior bodies. It may, perhaps, deserve no other rank in this respect than that of a rudimental part, establishing, by its presence, an approximation to more complicated beings, and adding a new but imperfect link in the chain upon which all such beings are typified.

The neck, body, and caudal vesicle of the cysticerci are all formed, apparently, of the same elements. They consist equally of transverse parallel fibres, which, after running a certain course, insensibly disappear, the circuit being completed by

others which arise and terminate in a similar manner. These fibres are no doubt muscular, and the degrees of transparency observable in different parts of the animal are perhaps due to their greater or less abundance. The whole exterior surface of the body is, then, it may be presumed, the agent for the imbibition of nutriment, and the parts called mouths contribute, in a very minor degree, if at all, to this function.

A consideration respecting hydatids, not less curious and interesting than that of their zoological and anatomical characters, is the manner and issue of the final termination of their existence. Some writers entertain an opinion that many malignant diseases, and others which, if not of a malignant nature, are yet not less certainly fatal, have their origin in parasitical animals, which by their growth contaminate and destroy the parent individual. Such, for instance, have been supposed to be the nature of cancer, fungus haematozodes, and more especially diseases of a tubercular nature. But all this is mere matter of conjecture: no facts have been hitherto advanced sufficient to establish the position that any such diseases are, either at their commencement or at any subsequent period of their progress, of such a character. No animal has ever been seen of any definite shape in connexion with them; and where the powers of the microscope can be brought with such effect in aid of investigations of this nature, why, it may fairly be asked, if such pestiferous animals exist, have they not, ere this, been demonstrated? The fact is, that all the circumstances connected with the growth and decay of such parasites as our senses can take cognizance of, tend to lead to a conclusion of an opposite nature, viz. that these animals have their periods of existence as living beings, and having passed from this state, instead of polluting the whole frame, or running into extensive diseases, disappear, and leave little or no injurious effects behind them, unless what may have arisen from their mechanical interference with the functions of some vital organ.

The details which I am enabled to offer respecting the na-

ture and order of the changes occurring during the degeneracy of the hydatids which have come under my notice, will not only place this matter in a clear light, but will afford a means of correcting views on the subject which to me appear erroneous, especially those adopted by the celebrated Bremser, whose expressions, as conveying the most approved doctrines, I beg leave to quote, before entering on the discussion of the subject. He says: "At first the limpid contents of the hydatid begin to lose their transparency, and the vesicle, formerly much distended, becomes flaccid; the fluid thickens more and more, it becomes yellow, and acquires a resemblance to soft cheese. The vesicle hardens, and finally its contents, which had been primarily fluid, are converted into a solid mass. When observations are made at an early period of the degeneration, some traces or packets of the corrugated tissue of the vesicle are still observable. At length it disappears altogether, and the *hydatid* transforms itself into a calcareous mass, which can sometimes be detached from the organ in which it lies as readily as the original, sound hydatid. This calcareous mass is also covered by a peculiar envelope." According to M. Bremser, therefore, the morbid alteration begins and passes through all its stages in the little animal itself. "The hydatid," he says, "transforms itself into a calcareous mass."

Now, according to my observations, the cyst of the hydatid,—the house in which it dwells,—is demonstrably the seat of these alterations, and is the instrument all through the process by which the degeneration is accomplished. The death of the contained animal may be, perhaps, the primary cause of disturbance in the cyst, but, as I hope to show, the latter is the sole agent by which the subsequent changes are effected.

In the omentum of the axis deer, examined by me, the hydatid tumours presented a great variety of conditions; and the phenomena of change from that which may be considered the perfect and full grown state of the worm, to that in which

nothing but a nucleus of bone occupied its place, were readily traceable.

In all those instances in which the least deviation from the above described healthy state of the tumours existed, the worm was found dead; its head and neck lay stretched out, and exposed to view, and not, as in the other instances, shut out of sight by inversion into the caudal vesicle; its tunics were opaque, and its contents muddy. It had certainly before this period undergone the phenomena of death, but, though dead, no decomposition of its textures had taken place, for it was by the examination of such specimens as these that I became best enabled to make the microscopic observations already alluded to.

The first changes from this state depend upon an inflammatory condition of the cyst, which becomes thicker in texture, and acquires, by the deposit of lymph on its internal surface, a roughened granular appearance, such as is frequently observed on the serous surfaces of the pericardium or pleura, previous to the establishment of adhesions. (See Fig. 4.) At a more advanced period the lymph is thrown out in greater quantity, and becomes adherent to the exterior of the worm, first by a few points, and subsequently all over the surface. (See Fig. 5.) But whether the adhesion be of an organized nature, or simply a mechanical agglutination of the parts, it is not easy to determine. I am, however, inclined to think that the connexion is only mechanical, as, up to the latest period at which the hydatid is discernible, it admits of being separated, though not without considerable pains and patience, from the new formed texture thrown out in its vicinity. The contents of the caudal vesicle, from being, after the first changes, of an opaque white colour, become, as the degeneration goes on, reduced in quantity, and acquire a more muddy, and, in some instances, a reddish character; and are, finally, completely absorbed, leaving the walls of the hydatid empty and collapsed. At this period, too, the exterior surface of the cyst becomes more adherent than formerly to the surrounding peritoneum, in consequence of the

slow extension of the inflammatory process from it to that membrane. In one diseased specimen which I examined, holding two hydatids, the animals were both found dead and empty, and squeezed up together by the surrounding extravasated lymph.

As the degeneration goes on, the tumour diminishes in size: it becomes more firm, loses the feeling of fluctuation, and when cut into exhibits nothing but softened lymph mixed with some curdy matter, and fragments of broken hydatid.

In more advanced stages, the tumour diminishes still farther in size, loses all traces of the hydatid inside, and appears in the section like firm cheese, but still surrounded by a capsule, which is, however, formed of the structures constituting originally the cyst, and not those of the degenerated hydatid, as described by M. Bremser.

Numerous hard, earthy tumours, about the bulk of peas, lay scattered over the omentum, among the other variously conditioned hydatids; and were, no doubt, the remains of former worms, which, having passed through the stages above described, had arrived at this, their latest and perhaps final degree of degeneracy.

With respect to the question, whether the disease in the cyst precedes, and becomes the cause of death in the hydatid, or that the animal itself passing into the state of death, and thence acting as a source of irritation on the investing membrane, gives rise to those changes in that texture which have been just described, it is very probable that the latter view of the case is the correct one, viz. that the worm having arrived at a certain age dies; that it then comes to act as a foreign body; and that all the subsequent changes which take place in the cyst, are merely the consequences which flow therefrom. The numerous and singular differences in the condition of the hydatid tumours, from that state in which they exist as translucent, and living bodies to that in which they appear in the form of small bone-like particles, would appear to indicate that a long

period had elapsed since the development of the first series of hydatids in the omentum, and that these having passed away were succeeded by others, which, in their turn, gave place to ternary and quaternary formations, each equally subject to decay, and running by the same processes into the same ultimate states of degeneration. In fact the animals might be said to have established in the omentum a sort of colony, propagating their young, passing through "les quatre âges de la vie," and finally converting their habitations into sepulchres, where their bodies passed into complete decay without further damage to the surrounding parts. There is most probably with these, as with all animated beings, a limit to the term of their existence, a period beyond which they are fated not to retain the condition of vitality.

The acephalocysts, which are often met in the human body, take a somewhat analogous course, but the result to the body in which they grow is likely to be different on account of their enormous accumulation in one part, and the consequent obstruction which they give to the functions of some particular organ. The liver is a frequent nidus for their development: they are generally collected into one cyst, in which great numbers are formed in succession,—the primary ones dying away, and being converted into detached extraneous matter, whilst new ones take their place, and subsequently run the same course. I have seen several instances of this kind. There are four such preparations preserved in the museum of the Royal College of Surgeons in Ireland; and I may mention another, which occurred in the practice of Mr. Trant of this city, in which the cyst opened externally by slough, and gave discharge to numerous acephalocysts, even during the life-time of the patient. All these cases were connected with the liver: the cysts were as thick and tough as leather, and capable of holding several quarts. When opened, they were found filled with a great variety of materials, but all evidently consisting of hydatid matter in different states and stages. In some parts, the hydatids were plump, transpa-

rent, and alive; in others, multitudes of them were found flaccid, opaque, and dead. Flakes of lymph, several inches square, rolled up in a singular manner, and apparently of the same texture as the vesicles of hydatids, occupied a large part of the cavity, and packets of cretaceous matter, in substance somewhat analogous to the ultimate degeneration of the cysticerci, filled up the remainder. These great cysts were, however, perfectly insulated; they entered into no direct union with the ultimate particles of the organ, and sent no roots through its structure. Their only interference with the liver was that of mechanical pressure, causing absorption of a portion of its texture immediately in contact with them, and diminishing thereby its bulk.

The great size and number of the specimens of cysticerci examined by me, afforded opportunities of witnessing the phenomena of degeneration on a scale which does not appear to have been offered to Bremer: his observations having been principally made on cysticerci located in the liver, in which the actual changes could not have been so free from the influence of surrounding objects, the conclusions to be drawn from them are more liable to a suspicion of error.

Besides, all the phenomena witnessed are more explicable, and more in accordance with our standard notions of pathology, on the principle that the cyst of the deceased hydatid, a part of the original living body, is the seat of the changes which occur subsequently to the death of the little animal, than that the latter should of itself, when dead, exert any influence in accomplishing farther alterations in its condition.

At all events it is very obvious, that no resemblance or connexion whatever, can be traced between the hydatid tumours of the omentum, and those tubercular cavities in the lungs, of which the animal died; the one, having passed through certain stages, disappeared leaving little trace of their former existence; the others, having progressed with a fatal certainty, ended in the total destruction of the organ in which they were developed.

EXPLANATION OF THE PLATE.

Fig. I. A natural representation of the external surface of the capsule of a full grown hydatid (*cysticercus tenuicollis*) in the healthy condition, stripped of the peritoneum.

Fig. II. The head, neck, body, and part of the caudal vesicle of the *cysticercus tenuicollis*, magnified.

Fig. III. A magnified view of the posterior part of the body, and adjoining part of vesicle, into which the remainder of the body, together with the head and neck, have been inverted.

Fig. IV. Fibrous capsule of an hydatid altered in texture by inflammation. It is thickened, diminished in size, and granular on the internal surface. The cysticercus removed from this capsule, was empty and opaque, and free from inversion of any part of the body, neck, or head.

Fig. V. Fibrous capsule, thickened and filled with lymph, which adheres to, and compresses the cysticercus contained within it. The lymph and hydatid have been brought into view by the elevation of a flap of the capsule.

Dr. HOUSTON'S views of the *CYSTICERCUS TENUICOLLIS*.

Fig. 5.



Fig. 4.



Fig. 1.



Fig. 2.



Fig. 3.





ART. VIII.—*Case of Poisoning by Sulphuric Acid.* By W. CORBET, M. B., Member of the Royal College of Surgeons in Ireland, and Lecturer on Medical Botany in the Medical and Surgical School, Park-street.

ANNE Taylor, aet. 18, was carried to Mark's Hospital August 2, 1830, at 11 A. M. Those who conveyed her said she had taken poison, and that from a quarter to half an hour must have elapsed.

Dark greyish marks or sloughs were observed across the upper lip, descending down the angles of the mouth; similar, but slighter marks, were on the forepart of the neck, chest, and on the right arm. Holes, as if burned, were seen in her clothes. It was evident she had taken some corrosive poison, probably sulphuric acid. After she was brought in she vomited, copiously, black glairy matter which fell on a sand-stone floor. Carbonate of magnesia, which was on the spot, was immediately given suspended in water; the vomiting continued at intervals; the matter last ejected being mixed with magnesia was not quite so dark.

A solution of carbonate of soda was poured on the several quantities of the vomited matter; the first effervesced briskly, while the last showed no effervescence. The acid was decidedly neutralized in the stomach. No particular distention took place in the epigastrium, as might have been apprehended from the evolution of carbonic acid.

She was put to bed; her surface was cold; her eyes and face ghastly; the pulse not to be felt at the wrist or temples, but beating feebly in the humeral artery. The vomiting had ceased; she lay pale, cold, motionless, and seemingly dying. External warmth was applied, and about three o'clock she had rallied a little; the surface was warmer, and the pulse beat feebly at the wrist. Linseed tea was pressed on her, which she vainly endeavoured to swallow. She complained of great pain

in the line of the oesophagus, and experienced some relief by having pressure constantly maintained over the epigastrium ; the intellect was clear ; vomiting of dark slimy matter occasionally occurred. She confessed she had bought for a penny some oil of vitriol ; from her account there might have been an ounce and a half or two ounces. The poor girl had been seduced in the country by a corporal, brought up to Dublin and deserted ; oppressed by regrets, probably suffering from hunger, she resolved on the rash act.

In the evening the pulse had risen to 108, feeble ; she had not made any further attempt to swallow. The tongue, cheeks, and mouth were swollen ; the breathing embarrassed and noisy ; vomiting has been frequent. A middling sized flexible catheter was passed down the oesophagus with very little pain or difficulty, and about half a pint of new milk thrown into the stomach.

3rd. She did not sleep during the night, but now feels rather drowsy ; pulse 120. No great tenderness over stomach. There is salivation, and a frequent but slight hawking or cough, and occasionally gulping ; pain along the oesophagus ; the tongue is covered by a hard milk-white case of thickened cuticle. In the course of the night she drank, four or five times, new milk, buttermilk, and mucilage ; she vomited but little, the matter ejected being tinged with bile.

Evening.—Pulse 120, firmer ; countenance rather improved ; speaks better ; does not vomit often ; fibrous matter appears mixed up with the discharges. The forepart of the neck is swollen. She has not swallowed since last night. The tube was passed, and milk, with a little lime water, thrown down ; but it was speedily rejected. Six leeches were ordered to the throat, and eight to the epigastrium ; stupes ; and a common enema, to be repeated if necessary.

4th. Faintness followed the application of the leeches, but relief was felt after the bleeding. The enema brought away a quantity of dark fecal matter. She constantly rinses the mouth

with cold water or mucilage ; has not swallowed since. The flexible tube was passed, it caused great pain ; eight ounces of milk were thrown down ; when the tube was withdrawn a little sloughy matter was found adhering to it.

At 9 p. m. she swallowed some water, and shortly after gulped up a mouthful or two of dark grumous blood ; the pulse became intermittent ; extreme pain, restlessness, and anxiety were experienced.

5th. 11 a. m. Pulse 112, weak ; has swallowed several times by spoonfuls ; speaks better, and is more cheerful ; the tongue has cast off its cuticle, and is quite red with prominent papillæ ; the pain and tenderness of the mouth, throat, oesophagus, and stomach rather diminished ; no vomiting ; slept tolerably, and has had two rather natural motions.

6th. Swallows a little now and then, but with effort ; the hawking has ceased ; pulse 92 ; abdomen below umbilicus bears pressure ; above, it is very tender.

7th. No sleep ; tenderness over stomach and along oesophagus much increased ; took some flummery at night. Leeches were applied to the epigastrium.

Evening.—General restlessness and soreness ; pulse 92, weak. One grain watery extract of opium and two of calomel were given, broken down in mucilage.

8th. Much relieved ; slept well ; swallows better than heretofore. Bowels open this morning. Stitches felt in right side.

Habt. Ext. Opii Aquosi granum, Calomelanos grana duo 8vis horis.

About 3 p. m. great pain and anxiety came on, and she vomited matter mixed with blood ; shortly afterwards a wide membranous tube, from four to five inches long, was ejected ; a portion of it seemed as if charred, in other parts it was tinged with bile. On close examination the branching of vessels is seen in it ; and as it possesses considerable tenacity there can be no doubt but it is a portion of stomach, and not any adventitious formation.

The anxiety and vomiting continued; and at 8 o'clock in the evening a long tube was cast up, evidently consisting of the mucous and nervous coats of the œsophagus; a part of it is quite charred, and transverse muscular fibres may be traced round one of its extremities.

After the ejection of these substances she felt comparatively easy, and swallowed with more facility, but the pain remained in the course of the œsophagus.

9th. Pulse 92, very feeble; she is extremely dejected; abdomen very tender, but not swollen: stitches in side, and soreness of œsophagus; she swallowed, while I looked on, some milk; the effort was painful. An opiate was given at night.

10th. Slept soundly, and appeared much improved; but hawks frequently, having the feeling of something remaining to be spit up.

From this time to the 17th, she appeared to mend rapidly; the vomiting ceased, as did also the tenderness of the abdomen; she swallowed better; the bowels were easily moved by enemata. On the 17th she had a fit of waterbrash, and threw up clear sour fluid. Magnesia with rhubarb and mint water were given.

The vomiting recurred from time to time, but was not very frequent; if there was little amendment up to the 21st, there was no deterioration. On the morning of the 21st she complained of soreness and swelling in her throat, referred to the cricoid cartilage. Every thing she swallows is rejected; there is great soreness at the cardia. A mixture was given, containing calcined magnesia and sedative liquor of opium; it checked the vomiting.

25th. She rested well; has not vomited for the last thirty-six hours, but gulped up, once, some clear sour fluid; she swallows pretty freely, and has taken a few grapes, and wine and water, which she relished. The throat near the cricoid is swelled and painful.

27th. Great difficulty in swallowing. A flexible catheter

was introduced as far as the swelling of the neck, where it was stopped; the parts being very tender the instrument was withdrawn.

28th. Has not swallowed since; the instrument was again introduced, but met with the same obstruction; by a little pressure it passed down two inches further, when its course was again arrested; the pain was too great to allow it to be pressed on.

29th. Tumour of neck increasing; she constantly rinses the mouth with cold water, but does not swallow; countenance anxious.

30th. Tumour of neck very tender to the touch; she has not swallowed since. Stupes and a poultice were directed, and enemata of broth.

31st. She got restless; arose from her bed, and walked down stairs; she says she is rather better. The swelling of neck increases; though fluctuation is not palpable, there is no doubt but matter is formed. A small blister was applied to the tumour; the enemata to be continued.

Sept. 1st. Countenance anxious; alæ nasi drawn in; pulse 140; she has not swallowed; a flexible tube was now carried down to the full extent, and a little milk injected, but the pain and distress were so very great that it became necessary to withdraw it: purulent matter was observed on the tube. During the day she threw up an ounce or two of fetid pus; she swallowed afterwards two or three times.

2nd. Passed a restless night; pulse rapid; countenance sunk; tumour rather more prominent. She swallowed a little in the course of the day, and there were thoughts of opening the abscess, which, though deep, was ascertained to have been formed; but her general debility was such, that the opening was not urged.

She expired at 4 A. M. of the 3rd. Having lived from the time of taking the acid thirty-three days.

Sectio Cadaveris, (about six hours after death.) A layer

of fat, more than half an inch deep, covered the abdomen; on exposing the cavity, the omentum was seen spread over the entire of the small intestines; it contained very little fat. The stomach was about five inches in length, by three and a half of extreme breadth; more than half its extent, towards the pylorus, appeared exteriorly perfectly healthy: at the greater end there was a little puckering and a slight red tint. When felt, some parts appeared thickened. There was no appearance of coagulable lymph over any part of the stomach or intestines, but rather more dryness than natural of the peritoneum. The ileum, towards its termination, was congested with dark blood. The colon contained scybalous faeces: the diameter of the intestines was, in general, less than is commonly observed. The other viscera were perfectly healthy; the gall bladder filled with bile. In the chest, on the right side, there were some adhesions of the pleuræ, nearly transparent; some coagulable lymph was thrown out in front of the pericardium, and there was an abscess in the space between it, the vena innominata and pleuræ. The heart was healthy. The tongue, larynx, trachea, œsophagus, stomach, and duodenum, were now removed. On dissecting down, the pharynx was adherent to the spine: and the surrounding parts were massed together by inflammation. To the right side of the cricoid cartilage and trachea, an abscess was cut into; it did not contain much matter, lay deep, and was covered by the sterno-hyoid and thyroid muscles, and appeared rather the course in which matter was making its way to the surface, than the centre of an abscess. The original abscess was lower down, behind the œsophagus, stretching to the third dorsal vertebra: it had two openings into the œsophagus; the one just below the cricoid cartilage, the other two or three inches lower down. The wall common to the abscess and œsophagus, was very thin and soft. The duodenum, stomach, and œsophagus were slit up; the lower part of the duodenum was quite natural; it contained a thin, yellow, pulpy matter, but nearer the pylorus, the parts appeared as if abraded of their

lining membrane ; the pylorus was much contracted, and rather hard. The stomach presented two different hues ; the portion near the pylorus being quite healthy in colour and consistence, with the prominent ridges usually seen in subjects dying suddenly : the other part was of a dark, somewhat livid colour, terminating abruptly in the healthy structure. A streak of the same dark colour, half an inch wide, went along the small curvature. It would appear that the acid had confined its action to the dark parts, and that a channel or passage had been given to it along the small curvature into the duodenum. At one part the stomach adhered firmly to the omentum ; opposite this there was a pit in its cavity looking as if the stomach had been corroded quite through at this point. The entire oesophagus had the same dark red appearance, except that part engaged in the formation of the abscess : there was no particular point of constriction, but the whole canal was diminished in size. Either mucous membrane or some succedaneum, resembling the walls of an abscess, covered the parts ; except by colour no line of demarcation can be drawn between the natural membrane, and that which supplies its place.

The immediate appearances or symptoms were the sloughy spots ; the great anxiety and burning pain stretching down in the line of the oesophagus and stomach ; the shivering, coldness, and faltering circulation ; and perhaps we may add, the vomiting. The sloughy spots were of a dark grey colour, the acid must have been strong, for the sloughs were of a considerable depth. When sloughs of this nature are produced by sulphuric acid, we should expect they would be more or less black : when from nitric acid, that they would be yellow. Yet this is not always so, if we are to rely on the cases that are to be met in authors ; for nitric acid has been several times found to produce dark-coloured sloughs in the stomach ; and the sloughs from sulphuric acid are often of a light grey or ash colour. The anxiety, coldness, and faltering circulation, are symptoms almost invariably present, probably from a general

sympathising of the constitution with the local lesion. The burning pain depends on the corrosion of the sensible parts by the acid, and on the subsequent inflammation excited. In this case there was this peculiarity, that firm pressure over the stomach, for two, three, or more days, alleviated, instead of increasing, pain.

The continued or supervening symptoms were the pain; difficult swallowing; embarrassed respiration; recurrence of vomiting; the ejection of the membranes of the stomach and oesophagus: to these we may add, apparent amendment; waterbrash; the formation of abscess; and the pleuritic symptoms.

It was not until the fourth or fifth day that any pain was felt on pressure of the abdomen, and even then it was confined to that portion of the abdomen above the umbilicus. The difficulty of swallowing arose at first from inflammation and swelling of the oesophagus and surrounding parts; subsequently the abscess between oesophagus and spine rendered deglutition impossible. The embarrassment of breathing depended on inflammation spreading to the larynx, its intensity was not great, nor its duration long. The recurrence of vomiting at such times as any thing is swallowed, is a very frequent accident; milk is most likely to rest on the stomach. It is in the ejection of the portions of the stomach and oesophagus that this case differs from most of those on record; yet in some of the cases recorded, large membranous flakes, or even cylinders of membrane, have been thrown up: the most remarkable case published is one wherein the internal membrane of stomach and oesophagus were passed in one piece by stool on the twentieth day of poisoning. The woman who was the subject lived for two months, and for part of that time appeared nearly convalescent. The celebrated Bichat opened the body. The internal surfaces of the stomach and oesophagus were quite smooth and polished, but very different in appearance from the state in which these parts are commonly found. The occurrence of

waterbrash, which was perfectly marked, was, as far as I have read, singular; I cannot pretend to account for it. The formation of abscess, in a situation different from the actual seat of injury, is by no means a rare event. The pleuritic symptoms may be attributed to a sympathy of the same sort. The skin was almost throughout, as it commonly is in similar cases, harsh and dry. Some symptoms, often noticed in other instances, as tenesmus, colica, pain on pressure, non-secretion of urine, and obstinate costiveness, did not occur.

It was extremely satisfactory to have observed the effect of the magnesia in neutralizing the acid in the stomach. Although it may perhaps be doubted that the acid in the stomach at the time retained corrosive properties; yet we have seen it was sufficiently strong to cause brisk effervescence with carbonate of soda. It shews, at all events, if any proof were wanting, that alkaline substances can correct corrosive acid properties in the living stomach; and that the administration of carbonate of magnesia is the best practice, if a case present itself to our notice shortly after an acid has been swallowed. The pure magnesia is objectionable from the great heat evolved when this substance is mixed with sulphuric acid.

The best, certainly, I might almost say the only source of information on the subject of poisoning by the mineral acids is, an excellent monograph by Tartra, published in Paris in the year 1801. Since that publication I find but few, and not very interesting cases, scattered up and down in the periodicals. It is curious that the greater number of these cases of poisoning have been from nitric acid; very few indeed from sulphuric acid; and scarcely any from the muriatic.

I shall only remark, in addition, that it seems very strange how such extensive lesion can occur to the stomach, and life still be prolonged. How is it that very slight appearances of inflammation or increased vascularity in the stomach and bowels are looked upon by Broussais and his followers as the cause of the worst fevers; and yet extensive lesion can occur as in

the present instance, and a chance of life be still left? It was not certainly in our case the exfoliation of the stomach, but the occurrence of the abscess, which was the determining or immediate cause of death. And several cases are on record, where, after very extensive lesions from concentrated acids, the patients have either lived for weeks or months; made imperfect recoveries, life being prolonged for years; or even perfectly recovered, no permanent mischief having followed.

The preparations of the exfoliations from the stomach and œsophagus, together with the œsophagus and stomach, were given to the College of Surgeons' museum.

ART. IX.—*Remarks on Partial Amputation of the Foot.* By
FRANCIS RYND, A. M., M. R. C. S., M. R. I. A., &c. &c.

THE subject of partial amputation of the foot having attracted a good deal of attention in consequence of Mr. Whatton's observations, as read at the Medical Section of the British Association, I am induced to offer the following case, partly in confirmation of his views, but more particularly to show how far nature is capable of substituting new parts for those that may be lost by disease, by accident, or by surgical operation. At the same time I may be permitted to remark, that this case should long since have been made public had I deemed it either sufficiently novel or important; for I never entertained an idea that any surgeon of modern times would think of removing all the metatarsal bones of the foot where the disease was limited to one, two, or even three of them. When the metatarsal bone of the great toe has been diseased, doubts have been entertained as to the propriety of removing the toe along with the bone, for future inconvenience has been apprehended lest the patient should be unable to stand or walk firmly in consequence of the loss of the ball. The following case will show how far such doubts and apprehensions are warranted, and to what extent the

efforts of nature are sufficient in supplying the loss or repairing the defect.

Wm. N——, Esq., aged about 25 years, applied to me in July, 1830, complaining of acute pain in the inside of the right foot, at the articulation of the metatarsal bone with the first phalanx of the great toe: it shot through the sole and dorsum of the foot, and up the leg to the knee; was excruciating at night in bed, or when the limb experienced any kind of pressure; position did not appear to affect it, for whether the leg rested on a horizontal plane, or was pendent, the pain was equally intense. The whole foot was swelled, and red, but the part in which the pain originated was of a darker red than anywhere else; the swelling here was shining on its surface, and did not pit on pressure. He had been only a short time ill, and could not assign any positive cause for the state his foot was in, but thought it was produced by his having leaped incautiously upon a stone while out shooting a few days previously.

He was ordered leeches and cold lotions to the foot, and after repeated applications they overcame the superficial inflammation; small blisters were then applied occasionally; and in three weeks the pain was so much relieved that he was able to walk; the swelling also had nearly disappeared; and he went to the country, and followed his rural occupations as usual.

In the middle of September the pain returned; he had recourse to leeching again, but without obtaining any relief; the swelling increased considerably, the foot became doughy; he had rigors; and when I saw him at the end of the month there was an abscess on the inside of his foot, situated about half way between the two articulations of the metatarsal bone; I opened it, and gave exit to some fetid dark-coloured matter. On introducing a probe the metatarsal bone was found to be denuded of periosteum for at least half an inch of its phalangeal extremity. He was ordered emollient poultices to the opening; in eight weeks afterwards a small portion of bone came away. From this time the discharge gradually diminished, and the opening

became partially closed by a papilla of flesh growing from its margin; the integuments still retained their dark colour and hypertrophied appearance; the pain abated very much; he felt comparatively better. However this interval of ease was of short duration, and with the new year, was ushered in new cause of suffering: another abscess formed, and pointing upwards from between the metatarsal bones of the first and second toes, burst on the dorsum of the foot. I did not see him at this period; nor until the month of March following, when it was too evident how seriously the disease and its consequences had affected his constitution: he was emaciated, his spirits depressed, his countenance pale and languid, he had perspirations at night, his pulse was 110; he was careless of taking sustenance, and listless of every thing around him; there was a constant and profuse discharge from both openings; a probe curved and introduced inferiorly passed round the metatarsal bone, and came out through the upper opening; the pain of the leg was not to be endured, particularly at night, and deprived him entirely of sleep.

He resided a long distance from Dublin, so that I was unable to attend to him, and proposed his coming to town immediately, to which he consented. As soon as he had recovered from the fatigue of the journey, he was told that it was necessary to have recourse to an operation to restore him to health; he agreed to its being performed, and on the 10th of March I removed the metatarsal bone and great toe in the following manner, assisted by my friend the Surgeon General, Mr. Colles, and Mr. Porter.

Having first ascertained that the second metatarsal bone was free from disease, by an examination with the probe, introduced through the opening on the dorsum of the foot, I made an incision, commencing a short way above the articulation of the metatarsal with the cuneiform bone, and terminating in the cleft between the first and second toe; it was internal and parallel to the tendon of the extensor pollicis muscle, using this at first as

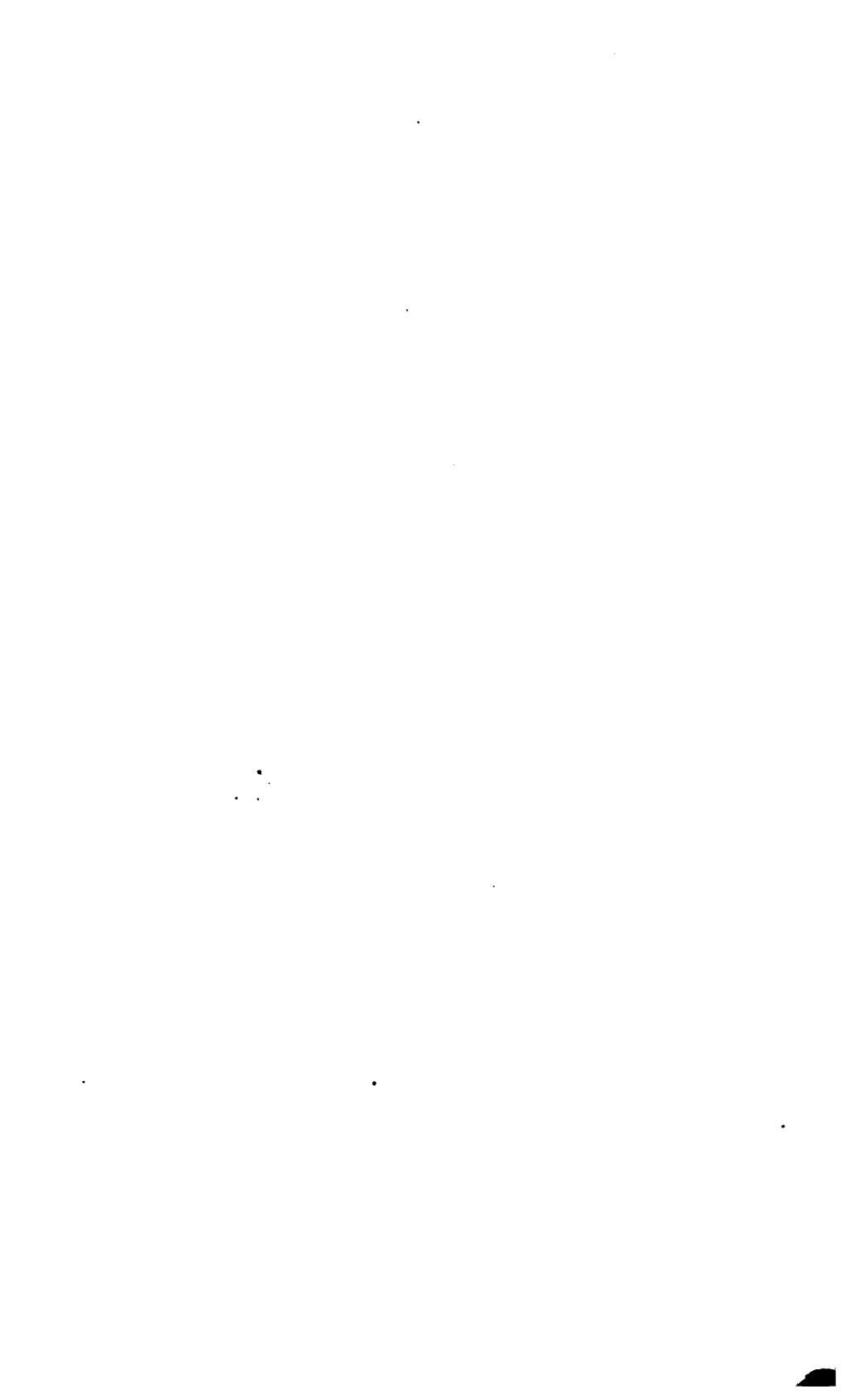


Fig. 1

Lines of the Incisions

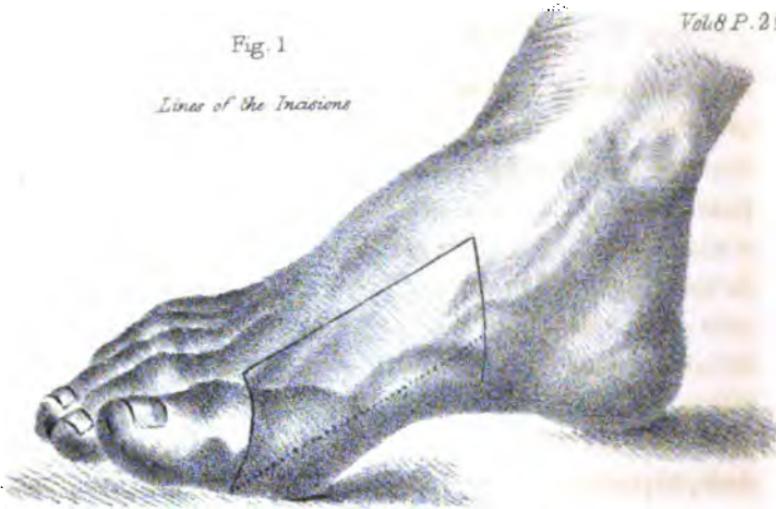


Fig. 2

The foot immediately after extirpation

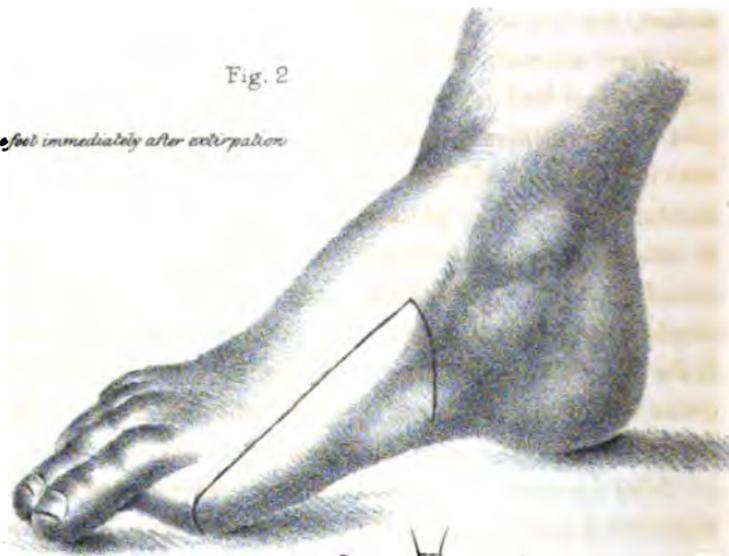


Fig. 4



a guide, in order to avoid the anteriotibial artery, although in the latter part of its course it was necessary to divide this tendon; the second incision commenced where the first ended, and passing through the extensor pollicis tendon down to the bone of the first phalanx, terminated in the hollow between the ball of the great toe and the toe itself; the third began at the same point as the first, and was continued at a right angle with it to the inferior margin of that portion of the tendon of the tibialis anticus muscle that is inserted into the cuneiform bone, which tendon was not divided.* The flap thus formed was dissected down, exposing a portion of the cuneiform bone, the first metatarsal, together with its phalangeal articulation, and part of the first phalanx itself; the knife was then pushed under the tarsal extremity of the metatarsal bone, and being kept close to its surface, the connexions which had not been destroyed by disease were severed, until it cut out in the hollow where the second incision had terminated, thus having passed beyond the joint of the metatarsal bone with the first phalanx; the bones were then cleared with the same precautions externally, and the metatarsal bone being pressed downwards, was separated from its attachments to the cuneiform, and with the great toe removed.† There were but two vessels tied, and not more than a couple ounces of blood lost. The portion of the pollicis tendon in the flap was taken away, the flap brought to meet the integuments above,‡ and retained there by adhesive plaster; he was placed in bed, and a cold lotion applied to the foot.

After the operation the gentleman experienced the most decided relief, particularly in the cessation of the nocturnal pain; and it is impossible to conceive any case more favourable in its progress than this, from the day of the operation to the time

* See Figure 1.

† The fistulous opening on the dorsum of the foot was in the line of the first incision; the other opening was in the flap, its cicatrix is manifest in Figure 3.

‡ See Figure 2.

when the wound was completely cicatrized, a period of seven weeks. The third incision, and part of the first adjoining it, healed by the first intention, the remainder by suppuration and granulation. The inflammation was healthy, and did not denote languor of the circulation, nor did any part of the flap show a tendency to gangrene. The hectic symptoms gradually subsided. He did not walk upon the foot until the month of July, some weeks after the healing process had been completed; but this was through fear of resting the weight of the body upon it, rather than from inability of the foot to give the necessary support. In September he walked well, but was obliged to lean upon a stick when he stood still, to prevent him from falling; he could not balance himself, nor did he re-acquire the power of doing so for nearly two years; he imputed the loss of it to want of substance on the inside of the foot: at present there is an extensive mass of flesh there,* of the same elastic consistence as the sole, bears pressure as well, although the skin covering it is rather delicate in texture; is not affected by the vicissitudes of temperature, nor does it exhibit any deficiency of organization. To this new production he attributes the power he possesses of standing with firmness and balancing himself, for according as it advanced in growth the power returned. However I am inclined to deem it attributable also in part to the restoration of the muscular tone of the limb; the muscles of the leg and thigh had been wasted and relaxed from the irritation and want of use incidental to the pre-existing disease, but now their health and vigour are quite re-established.

The only inconvenience he suffered for the last two years was, his shoe sometimes abrading the integuments covering the anterior surface of the cuneiform bone; this has been remedied by his own ingenuity: he wears an Indian-rubber sock under his stocking, padded so as to fill the space formerly occupied by

* See Figure 3.

A. *Section of the fibulae showing the division of the bone*

Fig. 3

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B. *Division of the fibulae showing the division of the bone*

B



the metatarsal bone, and fit close to the cuneiform; this affords a fine support for the shoe, and answers every requisite purpose.

The greater portion of the metatarsal bone in this case was carious, its phalangeal extremity was quite absorbed, but it was not diseased at its articulation with the cuneiform bone.

When the anatomical connexions of the great toe with the metatarsal bone are considered, and the use of the toe, which depends chiefly on the integrity of those connexions, it is easy to perceive the inutility of leaving it appended to the foot when the metatarsal bone has been excised. The next and paramount consideration with the surgeon, after having removed the diseased parts, ought to be, in all cases, how to render the mutilated limb most useful, and leave it in the best state for the exercise of those functions for which it was originally intended, always keeping a watchful eye to the patient's safety. Had not the toe been taken away in the above instance I do not think it is at all probable I should have attained that important object. In the first place the muscles that move the great toe are deprived of their chief support, as is the toe itself, when the metatarsal bone is taken away; the fibrous sheaths that retain the tendons of those muscles in their situation, and prevent them experiencing any other deviation than that caused by the contraction of the muscles to which they belong, are destroyed, therefore the muscles become incapable of acting in their proper direction, and their motions are performed without any degree of regularity or precision. I shall state some facts that came under my observation, in which this will appear sufficiently evident.

The late Mr. Hewson of this city removed the first metatarsal bone from the foot of a patient in the Meath Hospital for caries, and allowed the great toe to remain; the wound healed, and the patient was dismissed cured: but in some months after he returned, complaining that he could not use the foot from the position the great toe had assumed; it was drawn downwards and outwards, and lay transversely under the second and third

toes, both of which were in a state of ulceration where they were in contact with it; as regarded motion, its muscular power seemed to be feeble, and not available to the patient for any wished-for purpose; he could not move the toe in the direction he desired unless by taking hold of it; it was not practicable to retain it in a situation that left the other toes free, so that it formed an insurmountable obstacle to walking, and the performance of other functions natural to the foot.

This case occurred a long time previous to my operation in March, 1831, and the above is a pretty faithful account of the appearance the foot presented after excision of the metatarsal bone had been performed many months. I have but little more to urge in addition to what has been stated in the preceding pages, in favour of removing the great toe in all such cases, and shall only give an extract from Mr. N.'s letter, dated Sept. 1st, 1834, expressive of the happy results of this practice in his instance: "I can now make good and perfect use of the foot, and can walk, run, &c. &c. as fast and as well as formerly." I saw him a few days after the receipt of this letter, and "he went through his paces" most nimbly; he hopped upon the foot, and balanced himself in whatever position he pleased.

The most desirable objects then are attainable by this operation, the removal of the disease, and the restoration of "the good and perfect use of the foot."

I feel very cordial satisfaction in relating the results of this case, first, as regards my warm interest for Mr. N., who is in all capacities of life an excellent person; and secondly, because I think they may throw a light on the intelligence and practice of our art, by serving as a guide to the practical surgeon towards successfully availing himself of the powers of substitution and regeneration which are provided in the body for disease and injuries of its original organization.

ART. X.—*On the Structure of the Mammary Gland in the Cetacea, with Observations on the Mechanism of the Mouth and soft Palate, as applied by the young Animal in sucking.* By ARTHUR JACOB, M. D., Professor of Anatomy in the Royal College of Surgeons in Ireland.

[Read at the Meeting of the British Association in Dublin, August, 1835.]

In a work on this subject by M. Geoffrey St. Hilaire, entitled “*Fragmens sur la Structure et les Usages des Glandes Mammaries des Cetaces*,” some statements and inferences demand reconsideration. The notion entertained by the author that the young of the cetacea take refuge in the mouth of the mother, founded on an obscure passage in the works of Aristotle, and most improbable, when the structure of the parts is considered, does not appear to demand serious consideration. The observation that scientific works are silent on the subject, must appear extraordinary to those who have read Mr. Hunter’s paper in the Philosophical Transactions for 1787, or seen Mueller’s plate on the mammary gland in the porpoise in his work, *De Glandularum Secernentium Structura*, published at Leipsic in 1830. Mr. Hunter says, “the glands for the secretion of milk are two; one on each side of the middle line of the belly at its lower part. The posterior, from which go out the nipples, are on each side of the opening in small sulci. They are flat bodies, lying between the external layer of fat and abdominal muscles, and are of considerable length, but only one-fourth of that in breadth. They are thin, that they may not vary the external shape of the animal, and have a principal duct, running in the middle through the whole length of the gland, and collecting the smaller lateral ducts, which are made up of those still smaller; some of these lateral branches enter the common trunk, in the direction of the milk passage, others in the contrary direction, especially those nearest to the termination of the trunk in the nipple.” Mueller’s plate exactly corresponds with this

description of Mr. Hunter's, leaving little if any thing to add respecting the organization of the part in question.

It appears from the statements and reasonings of the author of the work alluded to, that his object is to prove that the process of nutrition of the young of the cetacea by the milk of the mother is accomplished in a manner and under circumstances different from that of other mammalia. To establish this conclusion he assumes, that the mammary glands in these animals are peculiarly organized and circumstanced; first, in being placed between the abdominal and subcutaneous muscles, by which they are subjected to mechanical pressure, adequate to the expulsion of their contents; and secondly, in containing a peculiar reservoir, formed by an enlargement of the excretory ducts, and running the whole length of the organ. Now it is certainly true that the mammary gland in the cetacea, at least in the smaller species, is covered by a subcutaneous muscle in common with a great portion of the rest of the animal's body, which muscle is obviously not exclusively devoted to the service of this organ, it being present in the male as well as the female; but it does not necessarily follow that it is capable of exercising that degree of circumscribed pressure required to produce the forcible expulsion of the fluid. The muscle is obviously, from its extent, destined for other purposes, and if its contractions have the effect of expelling the milk this effect may take place when the young animal is unattached, as well as when it is applied to the nipple. That the gland has, like all mammary glands, a reservoir within it capable of containing a considerable quantity of fluid, is equally true; it is called by Mr. Hunter, in the paper above alluded to, "the principal duct," and is represented, as has been observed, by Mueller, from a drawing by Professor Vrolik of a preparation in the museum of Bakker. It may also be seen in the museum of the Royal College of Surgeons in this city, opened and suspended in spirits, as well as filled with plaster and dried. The only peculiarity however in this respect, if it be one, is the existence of the mammary reser-

voir in the form of a single cavity. Every anatomist knows that the milk accumulates in the enlarged lactiferous tubes in, perhaps, all the mammalia, which tubes or reservoirs are necessarily numerous, when the organ is round and prominent, to conduct the fluid to a central nipple; but in the cetacea, the mammary gland being flat and elongated, to suit it to the general form of the animal, and the nipple being at the extremity, one duct or single lactiferous tube answers the same purpose. It even appears doubtful that pressure, applied externally, is calculated to expel forcibly the contents through the orifice of the nipple; on the contrary, a provision appears to exist to prevent the escape of the fluid in any considerable quantity except during suckling. A few drops may fall from the overloaded udder of the cow, or the nurse may be incommoded by the pressure of her dress on the distended breast, but it is not until the fingers of the milker or the gums of the infant pull upon the teat or nipple, that the distended lactiferous tubes can be completely emptied. If a speculation might be hazarded respecting the mechanical operation of the parts in question, it might be asserted that the orifice of the nipple is closed by an elastic structure, which prevents the escape of the fluid unless forced by pressure from behind.

M. St. Hilaire assumes that these animals cannot suck the mother while immersed in water; and even Mr. Hunter says, "the mode in which these animals must suck would appear to be very inconvenient for respiration, as either the mother or young one will be prevented from breathing at the time, their nostrils being in opposite directions, therefore the nose of one must be under water, and the time of sucking can only be between each respiration. The act of sucking must likewise be different from that of land animals, as in them it is performed by the lungs drawing the air from the mouth backwards into themselves, which the fluid follows by being forced into the mouth from the pressure of the external air on its surface; but in this tribe the lungs having no connexion with the mouth,

sucking must be performed by some action of the mouth itself, and by its having the power of expansion." These views and inferences, being the result of erroneous notions of the mechanism and application of the soft palate in the human subject, very generally adopted by anatomists, demand particular attention. This muscular flap or valve obviously performs duties connected with the functions of respiration, deglutition, and articulation, not inferior in importance to the tongue itself: the defective condition of the voice, and the imperfect deglutition when the palate is divided or injured by ulceration, sufficiently prove this. There surely can be no doubt that the free margin of the palate with the uvula is at one moment applied accurately to the root of the tongue, converting the mouth into a separate and distinct cavity, and leaving a free passage behind, between the larynx and nostrils, which passage is the next moment closed by the margin being brought with equal accuracy into contact with the opposite side of the pharynx, leaving a free passage from the mouth to the larynx and oesophagus. To prove this, let the lips be brought together, and air forcibly blown through them, when it becomes at once evident that such force cannot be exerted unless the passage through the nostrils be accurately closed, an effect only to be obtained by the soft palate coming into contact with the opposite side of the pharynx; next let the mouth be opened, and air forcibly driven through the nostrils, when it becomes equally evident that such force cannot be exerted unless the passage to the mouth be accurately closed by the soft palate being brought against the root of the tongue, or rather the root of the tongue against it. When air is forcibly inspired through the nose with the mouth open, it is obvious that the palate and root of the tongue are brought into close contact, otherwise the air must rush in from the mouth through the fauces; while respiring forcibly through the mouth makes it equally obvious, that the opening formed by the soft palate and back of the pharynx is closed, cutting off the communication with the nose. Inspiration through the mouth and

nostrils at the same moment does not appear to be a usual or regular process, and takes place only while the soft palate is in an inactive state, as in snoring when asleep, the sound in such case being produced by this part flapping or vibrating between the root of the tongue and back of the pharynx. The accuracy with which the soft palate closes the fauces may be further exemplified by inspiring strongly with the mouth open, while the nostrils are closed by the finger and thumb, when the cavities of the nose and ear are exhausted of their air, and a vacuum more or less perfect formed ; while when this operation is reversed, and air forcibly driven up into the same cavities, inconvenience is experienced from the distention of the tympanum of the ear and sinuses of the nostrils.

If these observations be correct it must necessarily be admitted, that the mouth is a separate and distinct cavity, formed by the hard palate above, the tongue below, the lips and cheeks in front and on the sides, and the soft palate behind ; capable of increasing or diminishing its capacity, and consequently of forming an imperfect vacuum into which the milk rushes in sucking, and from which, when accumulated, it is transferred to the œsophagus. That respiration is carried on freely and calmly during the process of sucking, may be ascertained by observation of the efforts of the infant when so engaged, and that a distinct cavity is formed, admitting of increase and diminution, may also be ascertained by observation of a person practised in the use of the blowpipe, as he keeps up an uninterrupted current of air while respiration is carried on by the nostrils. But it is not by the muscular mechanism of the mouth alone that fluids are carried to the stomach ; inspiration, by exhausting the cavities, accomplishes the same object, and is obviously an effort as practicable with the head immersed in water as otherwise ; as is fully established by the conclusive experiment of Dr. Traill, recorded in the Edinburgh Philosophical Journal ; and even without any exhaustion of the cavities the milk is forced into

the mouth by the compression of the nipple by the gums of the sucking animal.

It must not be forgotten that the construction of the soft palate in the cetacea is different from that in other animals; it is in them in the shape of a muscular partition with a circular aperture surrounded by a sphincter, while the top of the larynx is elongated so much upwards that it enters this aperture, and being grasped by the sphincter, communicates with the blow-hole or nostrils, leaving the mouth and fauces unaffected by the process of respiration, and still better adapted than in other animals to carry on the operation of sucking.

ART. XI.—*Abstract of a Communication respecting Venereal Diseases of the Testicle.* By J. W. CUSACK, M. D., one of the Surgeons in Stevens's Hospital, and Lecturer on Surgery in the School of Medicine and Surgery in Park-street.

[Read before the Surgical Society of Ireland.]

THE existence of an acute or chronic enlargement of the testis, originating in the action of the venereal poison, has been questioned by several practitioners of eminence, but so many surgeons of the highest authority have admitted the existence of venereal affections of the testicle, that we must assume the case to be proved; but here our knowledge, derived from published opinions of practitioners, ceases.

No person has ventured to class these affections, to describe the form of syphilitic affection with which the disease of the testis has been most frequently associated, or to explain, from dissection, the difference in the morbid appearances to be sought for in each.

Sir Astley Cooper, in his work on Diseases of the Testis, states, that he has so frequently seen this organ enlarged during the existence of secondary venereal symptoms, that he thinks it unreasonable to doubt its liability to be infected with the vene-

real poison ; he is of opinion that it most frequently accompanies eruptions and periosteal affections ; and he lastly rather hastily assumes, that the venereal infection primarily engages the tunica albuginea, and from thence extends into its interior fibrous and tubular part. It is remarkable, however, that with his extensive experience he never enjoyed the opportunity of verifying his opinions by dissection. Mr. Pott entertained doubts respecting the occurrence of a venereal affection of the testis at all ; and Mr. Benjamin Bell, one of our best authorities on the venereal disease, treats of the enlargements of the testis as a chronic disease, and appears to be of opinion that the body of the gland is the part first affected ; in the advanced stages, however, he frequently met with suppuration.

Mr. Ramsden, in his work on Diseases of the Testis, briefly passes over this part of the subject, and even seems to hesitate to admit the existence of the affection. From the few cases that he brings forward it appears that he considers the characteristic marks of the affection to be uniformity and smoothness of surface, combined with globular form, hardness, and resistance. Mr. Lawrence, from his published lectures, appears to be of opinion that the affection is occasionally met with, but seems unable to determine any series of symptoms which accompany it.

From the authorities referred to, and the general conviction of the profession, Mr. Cusack considers himself justified in assuming the existence of a disease of the testis depending upon the presence of the venereal poison in the system ; at the same time he admits, that as the disease occurs in the more advanced stages of constitutional lues, and after the use of mercury, a doubt must be entertained as to the influence which constitution and treatment may have in producing this disorganization, as well as many of the other accompanying affections which are daily met with in practice.

The disease in question is almost universally described by

authors as a chronic affection, coming on without pain or uneasiness, except that produced by mere distention and the weight of the tumour. The enlargement is at first confined to one gland, but often after a short interval the disease engages the other testis. The correctness of this statement Mr. Cusack in a great measure admits, but occasionally the inflammation comes on rather suddenly, and in what may be termed a sub-acute form; this distinction appears however to be influenced by the stage of the syphilitic affection at which the testes become engaged.

As the disease, as far as Mr. Cusack has observed, commences in the body of the testis, there is little alteration in the form of the organ in the first instance; as the enlargement advances, the tumour becomes more globular, the epididymis soon becoming involved, and lost in the general mass; the tumour has a fleshy feel, but differs much in density in different parts; it is said to be smooth and uniform on the surface, and primarily it certainly is so generally. Partial adhesions in the cavity of the tunica vaginalis, combined with effusions into that cavity, even independent of the internal changes which may be going on, render this a very uncertain symptom; so uncertain indeed, and so little uniform are the primary appearances, that Mr. Cusack believes the best practitioners would be unable to make a perfect diagnosis if unacquainted with the history of the case, and the attending circumstances.

The termination of the disease is either resolution or suppuration, or induration, and the formation of granular bodies, ending in total destruction of the functions of the organ. Mr. Cusack hesitates to believe, and is unable to affirm from his own practice, that this affection of the testis is met with in the earlier stages of secondary symptoms, or during the presence of any of the forms of true papular eruption.

The acute form alluded to is met with accompanying venereal hectic, pains in the bones, and either a scaly eruption or

perhaps a solitary spot, apparently belonging rather to the genus acne ; but these instances are comparatively rare, and of fifty patients at present under treatment in Steevens's Hospital there is not one case to adduce in confirmation of such an opinion. The patients who suffer from this affection are those persons who labour under affections of the periosteum and bones, and bear the marks of having suffered from pustular and tubercular eruptions.

The specimens of the disease submitted to the Society were wholly derived from persons whose constitutions were broken down from the protracted forms of the disease with which practitioners are familiar, but neither from his own opportunities nor any other source could Mr. Cusack exhibit a specimen of the changes which take place in the more curable forms of secondary syphilis. Ten preparations (selected from the collection in Park-street) were laid on the table exhibiting the disease in all the stages of its progress, from a small circumscribed tubercle in an otherwise sound testis, to the contracted, indurated, and completely disorganized gland. The structure of the tubercle is rather soft, but harder than common scrofulous tumour, and surrounded by a thickened layer resembling a cyst, the product of inflammatory action. In one preparation the tubercle is in the lower part of the testis, which is otherwise so sound that the epididymis admitted of injection by mercury, while in the opposite testis the tubercle was softened, and contained a glairy fluid.

Mr. Cusack noticed that the adhesions of the tunica vaginalis usually took place at the inferior portion of the testis ; and also gave it as his opinion, that the granular fungus often succeeded to the suppuration of one of these tubercular chambers.

ART. XII.—*A Case of Poisoning by Hydrocyanic Acid successfully treated by the Carbonate of Ammonia; with Observations on the medico-legal Relations of this Poison, and the Mode of detecting the Impurities which the medicinal Acid occasionally includes, &c.* By T. G. GEOGHEGAN, M. D., Professor of Medical Jurisprudence to the Royal College of Surgeons in Ireland.

THERE is no department of medical acquirement, in the prosecution of which it is of more importance to possess an extensive collection of recorded cases, than in medical jurisprudence; and of its various branches, the toxicological one demands it in particular. The physician, when called on to perform his duties as medical jurist, is, when thus provided, enabled, by a careful study and comparison of these, to give evidence, not grounded on loose analogical reasonings, but on an acquaintance with facts. By experience, either personal or derived, opportunity is afforded, of forming correct conclusions as to the average occurrence of the various phenomena which cases present, and of marking those which constitute deviations from the ordinary course, a class of especial interest to the medical jurist. Thus it is of great importance to be aware, that the arsenical poisons may cause death, without producing the usual signs of inflammation in the alimentary canal, and that opium has in a few instances manifested, instead of its ordinary tendency to constipate, a power of exciting diarrhoea and colic. It may be reasonably expected that under the present improved state of toxicology, the cases which have been within the last few years laid before the public, and are still from time to time appearing, will, at no distant period, furnish materials of great value towards the elucidation of the physiology, pathology, treatment, and medico-legal connexions of poisons. The following instance of poisoning with hydrocyanic acid is related with a view of increasing, as far as can be effected by so small a contribution, the

foundation of facts above alluded to. The particulars, which were related to me by the individual who was the subject of the poisonous effects of the acid, and by those who witnessed them, are as follows :

A gentleman, aged 21, having been for some time subject to an uneasiness in the stomach, not actually amounting to gastrodynæ, after having tried many remedies in vain, was induced to have recourse to hydrocyanic acid. He commenced with one minim of the acid of the Dublin Pharmacopœia, sp. gr. .998; this dose he repeated twelve times the first day, without any perceptible effect. On the following day he took half a drachm, with the same result. The third day his dose was a drachm, which he repeated the fourth day. On the fifth day he took a drachm and a half, still no effect of any kind. On the sixth day he increased his dose to two drachms. In about two minutes after taking this latter quantity, which produced a sensation of extreme bitterness in the mouth, and having walked a few paces, he experienced a feeling of great confusion, with headache, and loud ringing in his ears; he now with difficulty retraced his steps, and leaning forward on a table, became insensible, and fell backwards. In this state he remained altogether between three and four minutes, during which time he was violent convulsed, and to use the expression of those present, (who were of the medical profession,) affected like a rabbit poisoned with the acid. Two drachms of the spiritus ammoniæ aromaticus were diluted with a little water, and applied as quickly as possible to the mouth, but as the teeth were clenched he could not be got to swallow any. The solid sesqui-carbonate of ammonia was then applied assiduously to the nostrils; its beneficial effects were soon apparent, and he was shortly able to swallow a little fluid. Sensibility now speedily returned, and vomiting supervened, from which he experienced great relief; and at the expiration of half an hour he was quite well, with the exception of pain and feeling of distention in the head, which continued for the rest of the day. His old complaint was com-

pletely removed by this extraordinary dose. Those who witnessed this case informed me that after he had become insensible, and while leaning on the table, his thighs were drawn up on the abdomen, and rigid; and as he was about falling they caught him, and placed him on the ground. The upper extremities were then observed to be also rigid; and on drawing them from the side, they forcibly reverted to their former position; the eyes were shut, the teeth clenched, and the muscles of the face violently convulsed. The *spiritus ammoniae* being at hand, was applied very shortly after the supervention of the symptoms just detailed. It should be mentioned that the acid taken on the various occasions was diluted with water; the total quantity consumed being a little more than six and a half drachms of an acid purporting to be that of the Dublin Pharmacopœia, the per centage of real acid in which, according to Ure's table, should be 1.5.

The above case presents a very good example of the poisonous effects of the hydrocyanic acid, resembling very much those observed in animals. It is also, I conceive, of considerable interest, as from the circumstances under which it occurred, namely, having been witnessed throughout its whole course by persons competent to observe the symptoms, an opportunity was afforded of acquiring data connected with the determination of some points of importance in the medico-legal relations of the poison, one seldom to be obtained where this agent has been taken by accident, or for purposes of self-destruction. In a paper on the subject of the treatment of this form of poisoning in the *Annales de Chemie*, vol. xlivi. by MM. Persoz and Nonat, they divide the symptoms into three stages: 1. that of general malaise; 2. tetanus; 3. interrupted respiration, or what Orfila occasionally terms the stage of flaccidity and insensibility, during which the pulse rapidly fails, and finally becomes extinct. By malaise, they most probably mean to express the agitation, giddiness, and faintness observable at the very commencement of the action of the poison. The other

terms sufficiently explain themselves. I have frequently observed in animals to which this acid had been administered, that they perform rapid motions with the mouth and jaws, as if a powerful impression had been produced on the nerves of taste. Coullon* states that in experiments which he performed on his own person, he experienced an insupportably bitter taste. This symptom, which circumstances might render of some importance, was also present in the instance which I have related. The other effects which Coullon states himself to have experienced from doses varying between twenty and eighty-six drops of the acid (of Vauquelin?) were, nausea, hurried pulse, weight and pain in the head, succeeded by a feeling of anxiety, which lasted about six hours. As far as I have been enabled to judge by a perusal and comparison of cases, it would appear that in man the coma is often well marked previous to the occurrence of convulsions. In animals, on the contrary, convulsions frequently, if not generally, precede coma, or at least occur while the coma is but yet incipient. Nausea and vomiting often present themselves in the commencement of this form of poisoning in animals, and in man they are pretty constant effects of too large medicinal doses; they also occasionally supervene after the long continued use of the acid. In the case detailed vomiting was not present at the commencement. This symptom is mentioned by some writers as one of those indicating the progress towards a fatal termination. If however we examine recorded instances, we shall, I conceive, find reason for concluding, that although it may occur late in the order of symptoms of poisoning, it is generally a favourable one. In the case above related it was followed by great relief; and Coullon mentions many instances in which dangerous, and even alarming symptoms were dissipated by the occurrence of spontaneous vomiting. The headache and sense of distention which

* *Recherches et Considerations sur l'Acide Hydro-cyanique.* Paris, 1819.

remained for the rest of the day, in the instance recorded in this paper, was probably the result of reaction following the depression of the nervous energy.

Although the phenomena of poisoning by the hydrocyanic acid leave no doubt of its exerting its energies on the nervous system, yet concerning the precise nature of its primary action, there appears still to exist difference of opinion. In its toxicological relations there can be no doubt of the propriety of classing it amongst the narcotic poisons, if these be considered as agents " inducing a state of the nervous system resembling apoplexy, epilepsy, and other disorders usually called nervous."^{*} If it be examined, however, in reference to its therapeutic action, many circumstances appear to demonstrate the propriety of bestowing on it a place amongst " sedatives," as has been done by Dr. A. T. Thompson in his late work.[†] The distinction drawn by this writer between sedatives and narcotics being, that while both diminish the energy of the nervous system, this diminution of energy is, in the case of sedatives, a primary effect, but in narcotics secondary to an excitant one.

With reference to the particular instance of hydrocyanic acid, as Dr. Thompson justly observes, " the general character of the symptoms induced by that powerful agent indicates a diminution of the nervous energy." It can hardly however be conceded as *universally* true, that the effect of the acid is to diminish the force and frequency of the pulse. In Dr. Elliotson's excellent work on the Medicinal Applications of Hydrocyanic Acid, he states, that in his hands " it has always proved unable to lessen the quickness and violence of the pulse when there was simply excessive action of the heart. Dr. Prout, who made trials of the acid at Dr. Elliotson's request, has never " been able to ascertain that it sensibly affects the pulse;" administered in larger doses than those applicable to the treatment of dis-

* See Christison on Poisons, second edition, p. 577.

† Elements of Materia Medica and Therapeutics, vol. i. p. 419, et seq.

ease, as in Couillon's experiments on himself, the pulse was, on the contrary, accelerated; in fact rose from 58 to 78, and had not regained its usual rate for an hour and a half. In experiments on animals I have no doubt that it has occurred to others, as well as myself, to find the pulse increased in frequency, if not in strength. Dr. Granville, in discussing the poisonous effects of the acid, states the pulse to be either quick and wiry, or slow and vibrating. The first of these conditions however does not prove the existence of an excitant action, as it relates to one only of the group of symptoms which indicate the existence of such action, and that symptom one, not connected directly with the nervous system, but with a function subordinate to it, and secondarily affected. The concomitant faintness, stupor, lowness of spirits, prostration of strength, &c. indicate, whatever may be the state of the heart's action, a depression of the nervous energy. It is scarcely necessary to observe, also, that there are many diseases in which, while the nervous influence is impaired, the pulse is more frequent than in a state of health.

From these observations it would appear, that although, from the general effects which hydrocyanic acid is capable of exerting,* it merits being placed in the class of sedatives, it is not necessary, as it would appear to be, (from the general tenor of Dr. Thompson's remarks on the latter,) that it should uniformly diminish the frequency at least of the pulse. In case of poisoning with opium, where there is an acknowledged impairment of the natural energies of the nervous system, and where the existing symptoms appear on the whole to be those of a sedative action, the pulse is often quicker than ordinary, when slower than in health it frequently is preternaturally full, so that it is possible that under these circumstances the momentum of the circulating fluid does not, on an average, differ essentially from its healthy amount.

The case detailed in this paper presents a circumstance of

* To these it may be added, that, unlike narcotics, it seldom induces sleep.

importance, both in reference to the medicinal administration of the acid, and as concerns medical jurisprudence, namely, that while a dose of a drachm and a half produced not the slightest injurious effect, two drachms gave rise to the violent symptoms of poisoning already detailed. Before proceeding it is necessary to state the strength of the acid used: from a careful examination of two distinct portions, I ascertained the percentage of real acid to be .60, it therefore had a strength bearing the proportion to that which an acid of .998 should have, (according to Dr. Ure's tables,) of .6 to .15; in other words, the reputed strength of the acid of the Dublin Pharmacopœia is $2\frac{1}{2}$ times that of the fluid employed in this case, and the percentage of the acid generally used in England, if correctly prepared and carefully preserved, is five times as great. From calculation, however, grounded on the quantity of materials employed, the strength of the acid of the Dublin Pharmacopœia *should* be about three per cent.; the acid which was used in the instance under consideration was prepared from the ferro-cyanide of potassium, and it should be mentioned, that its chemical examination was not undertaken for a few weeks after its employment; it had been, however, carefully preserved, and when I got it was perfectly limpid, and possessed strongly the characteristic odour of the poison.* It is also well known to chemists, that acid prepared from the ferro-cyanide of potassium, even when tolerably strong, will remain, when exposed to the diffuse light of day, unaltered for many months, nay, for more than two years. Having premised so much concerning the strength of the acid employed, it is obvious that the difference, as to quantity of real acid, between one and a half, and two drachms must have been very trifling, although the conse-

* It is necessary to recollect, that specimens which include a very minute portion of real acid, may, nevertheless, exhale a comparatively powerful odour, and that therefore no conclusions as to strength are to be founded on the existence of the latter.

quences of their administration totally different. This statement, as to the effect of minute difference in dose, is strikingly confirmed by Dr. Elliotson, and also by the experiments of MM. Parent and Duvignau ; the former administered seventeen minims three times a day to a woman in consumption, " without inconvenience or benefit ; eighteen minims brought on vomiting and giddiness." The distilled water of bitter almonds, used by MM. Parent and Duvignau, which must be an exceedingly dilute prussic acid, although it produced very slight effects in doses of eighteen drops, when the quantity was increased to twenty-two drops, gave rise to alarming symptoms, such as convulsions and vomiting. There can be little doubt that in the case which I have related, a dose intermediate between one and a half and two drachms might have been given without inconvenience.

This property of hydrocyanic acid, which appears to have been hitherto little noticed by writers, is obviously of considerable importance, and leads to the consideration, whether under any circumstances it can be considered as possessing an accumulative power. The opinion of toxicologists in general is opposed to this supposition ; nor do I conceive that the case under consideration affords it much support. It should however be recollected that the poison is capable of entering the blood, as is demonstrated by a variety of circumstances, which it would be out of place here to allude to, and indeed most probably absorption is essentially preliminary to the action of the medicinal acid. The facility with which the acid undergoes decomposition, or is exhaled by the pulmonary surfaces, does not preclude the possibility of its possessing a power of accumulation, as digitalis, the active principle of which is no doubt readily decomposed, and iodine, which rapidly passes off by the kidneys, are notoriously cumulative poisons. The continued use of hydrocyanic acid has also, in instances by no means few, produced salivation and ulceration of the mouth. Whether then there be conceded or

not to this poison a power of accumulation, it should be borne in mind, for many reasons, that minute difference in dose is capable of producing the greatest disproportion in effects. Occasionally the acid presents the most extraordinary anomalies in its action. Thus, Richard* states that he has known a patient take from six to eight, and even twelve ounces of laurel water in the twenty-four hours, without any symptoms of poisoning; and conceiving the preparation must have been either inert or spoiled, he had some prepared by one of the first pharmaciens in Paris; its administration was followed however by the same results. Dr. Montgomery has mentioned to me, that while he has failed in killing a cat with a drachm of the medicinal acid, a drop and a half of the same acid (kept for three years longer) almost instantaneously destroyed a rat. Before I was aware that there was any thing in print on the subject, I had formed the conclusion, from experiments, that the acid acts much less energetically on young animals than on old ones. Orfila's statement, I perceive, is the opposite; he does not, however, give the grounds on which his opinion is founded. In the great majority of experiments which I have since made on the subject, young animals have been less sensible to its action; in some few, however, the poison appears to act just as energetically on the latter, as on those which have attained their full growth and vigour. The interval which may elapse between the reception of the poison into the stomach and the commencement of its action, became a question of the greatest importance† in a trial which occurred in England a few years since. Five drachms of the medicinal acid had been taken, and the bottle was found corked and wrapped in paper beside the bed, in which the deceased lay in a composed posi-

* *Dictionnaire des Drogues simples et composees.*

† Trial of Freeman, for the murder of Judith Buswell at Leicester, April 2, 1829. See also Christison on Poisons, 2nd edition, p. 666.

tion; the question naturally arose, whether the deceased, after taking that quantity, could have had time to perform the various acts which the position of the body and surrounding objects indicated to have been effected. In the instance detailed in this paper, a quantity equal to twenty-five drops of the English acid, supposing it to possess a strength of 3 per cent. or to fifty drops of the acid of the Dublin Pharmacopœia, (if it contains $1\frac{1}{2}$ per cent.) commenced to act in two minutes q. p.; if we can suppose the rapidity of its action directly proportioned to its quantity, then twelve times as much, or five drachms, should begin to operate in the one-twelfth of the time, or ten seconds, within which period the acts above alluded could certainly be accomplished. I should not wish to be understood as asserting that this is the exact proportion, but that one possibly not differing very materially from this may be found to exist. As to the smallest quantity capable of producing death, in the case I have detailed the quantity of real acid amounted to .7 of a grain, which was almost the same as that taken by a number of epileptics in a dreadful accident which occurred at one of the Parisian hospitals, and by which seven patients lost their lives; some of them survived for three quarters of an hour; the period however during which life may be prolonged in this form of poisoning must vary considerably according to the treatment employed. The case related in this paper illustrates very strongly the beneficial effects of ammonia, or its carbonate; the good results of this remedy are conceived to flow, not from its chemically neutralizing the acid, but in consequence of its exerting on the system an influence of an opposite nature to that of the poison, or, in other words, from its stimulant powers. In proof of this assertion it is stated that the hydrocyanate of ammonia is highly poisonous. That this salt is capable of exercising a decidedly deleterious action is certain; but this may be readily ascribed to its decomposition by the free acids of the stomach, (as has been suggested to me by my friend Professor Apjohn); to determine this point it would be necessary to ascertain whether if these acids

were first neutralized, or if a solution of the salt were injected into the blood, the same results would ensue. The experiments of MM. Persoz and Nonat, detailed in the paper already alluded to, seem to indicate that chlorine, when applied to a vein, is absorbed, and exercises its action as an antidote by decomposing the poison in the blood ; and as the respiratory surfaces are eminently qualified for performing the function of absorption, there is no reason why both this agent and ammonia may not enter the system by the latter route ; whether, however, ammonia be taken into the circulation or not, a great part of its beneficial influence must be attributed to its excitant powers. On the whole it appears to be one of the agents on which most reliance is to be placed in this form of poisoning. Chlorine, which decomposes the poison, most probably also effects a good deal by its stimulant action. Chlorine water, the most manageable form in which this agent can be applied, is rarely at hand ; at present, however, chloride of lime or soda is as likely to be easily procured as any other medicine, and either of these can be made to evolve its chlorine rapidly by the addition of vinegar, or any of the ordinary acids. Very possibly after the patient has been to a certain degree restored by the use of these antidotes, his more speedy recovery might be promoted by an emetic, and for this purpose the sulphate of zinc, mixed with some stimulant fluid, as wine, or brandy and water, would be most suitable, as less liable to produce depressing effects, than some other medicines of the same class. The great relief occasionally obtained from the occurrence of spontaneous vomiting, naturally suggests the employment of these agents : they are, however, of course merely of secondary importance ; the object of our first attention being the judicious application of the stimulants above mentioned, ammonia or chlorine.

To the case already detailed, I shall add a few particulars of the dissection of one which terminated fatally.

A schoolmaster of this city, who had met with some misfortunes, determined to put an end to himself ; he purchased an

ounce of the medicinal acid, (Scheele's,) and swallowed it, as was presumed, at bed-time. Next morning he was found dead. The body, which was examined shortly after, and the stomach in particular, exhaled strongly the smell of the poison. The only morbid appearance of note discovered, was a patch of dark-red extravasation under the mucous membrane of the stomach, near the pylorus; an appearance which seems to have been mistaken for gangrene in a case related by Hufeland.* This appearance I should conceive to be allied to the black warty extravasation observed in cases of irritant poisoning. The stomach exhaled the hydrocyanic odour, although exposed for three days, at the end of which time the poison was detected by the usual means in the contents.

The method proposed by Orfila for the detection of hydrocyanic acid in mixed fluids, is exceedingly convenient, if a precaution which he has not noticed, be observed. His method is to moisten a slip of bibulous paper with a solution of caustic potash, (carbonate of soda or potash will answer, if the caustic solution be not at hand,) afterwards immerse it for a few minutes† in the suspected fluid, then dip the paper in a solution of the proto-sulphate of iron, (which always contains the necessary quantity of ter-sulphate of the peroxide;) if hydrocyanic acid have been present, prussian blue is immediately generated.

If the experiment be conducted as above directed, there always falls down, along with some prussian blue, a quantity of the mixed oxides of iron, which render the colour of the precipitate a dirty green, instead of dark-blue; and as the fluid is mechanically united with the paper, its particles cannot circulate

* *Journal der Praktischen Heilkunde*, 40, 1, 85.

† It should be agitated in the fluid, in order that the neutralization of the potash by hydrocyanic acid may be fully effected. Every 9 eq. of hydrocyanic acid decompose 3 eq. of proto-sulphate and 2 of the ter-sulphate of the peroxide; these, together, are combined with 9 eq. of sulphuric acid: to liberate only the quantity of oxide necessary to form 1 eq. of prussian blue, 9 eq. of potash are necessary; in other words, as much as will form with the hydrocyanic acid present hydrocyanate of potash. ($CyK + H.$)

and intermix with sufficient freedom to convert the oxides, by contact with the hydrocyanic acid, into prussian blue; it is necessary then to obtain the characteristic colour of the latter; to dip the paper lastly into dilute sulphuric or muriatic acid, by which the redundant oxides are dissolved. If this precaution be not observed we may be led to conclude erroneously that a given mixture contains no hydrocyanic acid.

When the contents of a stomach or the fluid distilled from them are tested for hydrocyanic acid, by the method of Lassaigne, (which Orfila has merely modified by using a slip of bibulous paper, instead of adding the re-agents to the mixture,) it is also necessary, as he has stated, to use dilute sulphuric acid, because unless the proto-salt of iron added contains the per-salt exactly in the proportion of 2 eq. of the latter to 3 of the former, a certain quantity of the oxides of iron must precipitate, as will be obvious when we reflect on the composition of prussian blue. ($3\text{FeCy} + 2\text{Fe}^2\text{Cy}^3$). If, however, the proto and per-salts should happen to be mixed in the above ratio, although at the moment they are added the oxides precipitate, the latter can, by agitation with the fluid for a short time, be converted into prussian blue, provided that the solution of potash have been added in very small quantity, (only sufficient to form hydrocyanate of potash, as before mentioned); the solution of sulphate of iron, however, can very seldom happen to contain the exact proportion of per-salt above mentioned, and therefore the subsequent addition of dilute acid is almost always indispensable. This method is not only, as Dr. Turner has shown, more delicate than that by the sulphate of copper, but more distinctive, and therefore to be preferred. Before concluding this paper, I shall notice a method which has occurred to me for the more ready detection of hydrochloric acid, when it exists in the medicinal hydrocyanic acid; more especially as it is necessary to ascertain the absence of this impurity, and to effect its removal, if present, before we can hope for a successful estimation of the strength of the acid by the usual methods. The insoluble compounds into which chlorine enters, and by the formation of

which chemists usually recognize the presence of hydrochloric acid, are well known to resemble very closely in their properties the cyanides of the same bases. Modes of distinguishing the cyanide from the chloride of silver are laid down in most systematic works, but they are either inconvenient in their application or do not afford accurate indications when small quantities are operated on. The method which I am about to detail is founded on the property which the double salt, formed by the union of the iodide of potassium with the bi-cyanide of mercury,* possesses, of being decomposed by acids, with the development of bin-iodide of mercury. This double salt is readily prepared by mixing, in the proportion of atom and atom, solutions of bi-cyanide of mercury and iodide of potassium, each dissolved in a small quantity of hot water; after a short time silvery scales (resembling acetate of mercury) make their appearance, which constitute the compound in question. The circumstance of this salt being decomposed by all the ordinary acids, (except hydrocyanic,) would at first sight appear to indicate that it is not capable of detecting the hydrochloric in particular; but as the only other impurities likely to be present in hydrocyanic acid are sulphuric and tartaric acids,† if the appropriate tests of these latter do not indicate their presence, then the formation of bin-iodide of mercury on the addition of a crystalline scale, or solution of the above salt, may be considered as affording conclusive evidence of the presence of hydrochloric acid. It may be also stated, that the only hydrocyanic acid likely to contain sulphuric, namely, that prepared from the ferro-cyanide of potassium, can be generally recognized by its possessing a slight bluish or bluish-green colour, which is quite distinctive.‡ The mode of detecting the pre-

* This salt has been analyzed by Professor Apjohn, who finds it to contain an atom of each of its constituents.

† Either free or combined with potash as a bi-tartrate, in the acid prepared by the method proposed by Dr. Clarke.

‡ Owing probably to its holding in solution a small quantity of prussian blue.

sence of hydrochloric in hydrocyanic acid, just detailed, has the advantage over those generally in use of being very readily applied, to which it may be added that the preparation of the reagent is perfectly simple. With reference to the latter it may be observed, that it is not absolutely necessary to obtain this salt in a separate state, with a view to its application as above ; it will suffice to add to the hydrocyanic acid suspected to contain the impurity under discussion, a few drops of a solution of bi-cyanide of mercury, and afterwards a drop of dilute solution of hydriodate of potash. In experimenting, however, in this way, great care should be taken not to add an excess of hydriodate of potash, as it dissolves the bin-iodide of mercury ; this method, where the quantity of impurity present is very minute, is by no means so delicate as the addition of a crystal of the double salt, a yellowish red coloration of which will take place where only $\frac{1}{3300}$ part of hydrochloric acid is present. This method of testing the presence of the latter is inapplicable to the alcoholized acid of Germany, as the bin-iodide is soluble in alcohol, yielding a colourless solution. If the presence of hydrochloric acid (or of any of the other acid impurities) have been ascertained, their neutralization can be readily effected by the addition of successive small portions of precipitated carbonate of lime, as long as any is dissolved. When the acid contaminations have been neutralized, (and filtration, if necessary, performed,) the estimate of the strength of the acid may be proceeded in according to the method of Dr. Ure, substituting for the red precipitate which he employs, per-oxide of mercury, thrown down from a solution of per-salt by an excess of potash, as, independent of minium and other adulterations, the red precipitate, from the mode of its preparation, almost always includes a little bi-per-nitrate of mercury. To those practitioners who are accustomed to chemical manipulation, the method of Orfila, precipitation by the nitrate of silver, is fully as expeditious, and certainly affords more strictly accurate results.

Not only may the peroxide of mercury be used for estimating

the strength of hydrocyanic acid, but also for the detection of hydrochloric acid in it, by the following proceeding, which is less delicate than that already detailed: dissolve in the acid a little peroxide of mercury; when the solution is complete, add either caustic potash, lime water, or carbonate of potash; if hydrochloric acid be present, the two former will give rise to the usual precipitation of peroxide, and the latter of the di-carbonate of mercury, of an ochre-brown colour; if, on the contrary, the hydrocyanic acid have been pure, no change ensues. These phenomena are no doubt owing to the feeble affinity existing between cyanogen and the alkaligenous metals, potassium, sodium, &c. To this same cause also must be attributed the formation of the double salt, of which I have proposed the application already detailed. The uncertainty of the strength of the medicinal acid has been long matter of complaint, and examination of many specimens has convinced me that even where the directions of the *Pharmacopœias*, as to quantity of material, have been observed, slight variations in the method of conducting the different steps of the process exert a material influence on the strength of the product.

Under these circumstances it can hardly be expected that in preparing this substance on the large scale, an agent of uniform strength can be obtained; our obligations are therefore the greater to those whose recent and successful endeavours* to accomplish this end have furnished the profession with the means of extending the use of this powerful agent, and of presenting, with security, inquiries as to its ulterior therapeutic applications.

* The latest method, I believe that devised by Mr. Everitt, Professor of Chemistry in King's College, London—the decomposition of cyanide of silver by hydrochloric acid, with the addition of the requisite quantity of water, appears to be a very simple and excellent one; the cyanide of silver has the advantage over the cyanide of potassium in being very readily prepared and easily kept.

ART. XIII.—*Case of Pulsation in the Veins of the upper Extremities.* By Charles Benson, M. D., M. R. I. A., Member of the Royal College of Surgeons in Ireland, one of the Surgeons of the City of Dublin Hospital, &c. &c.

MARY OLIVER, aged 60, of middle stature, pale, weak, and emaciated, was admitted into the City of Dublin Hospital on the morning of the 14th of August, 1835. She could scarcely give any account of herself, except that "it was all about her heart." The following notes of her case were taken as soon as she was placed in bed:—She talks incoherently; is very restless, tossing the clothes about, and seeming uneasy in every position; pulse 80, soft and regular; tongue clean; eyes clear; skin natural. On placing the fingers lightly over the apex of the heart a sensation is communicated to them not unlike that which emphysema of the cellular tissue would occasion, but it is lost on the least increase of pressure. Resonance very dull over the whole of the precordial region; impulse considerable, may be felt as high as the clavicles, and peculiarly strong in the epigastrium; a loud bellows murmur is heard over all the region of the heart, sometimes mingled with a rasping noise; the latter is best heard in the second sound, the former in the first; vesicular respiration every where distinct.

Aug. 15. She became comatose last night, and has not since spoken; face flushed; some old cicatrices were observed on the scalp, when shaved; pupils moderately contracted; skin natural.

While feeling her pulse, and reflecting on the symptoms before me, I was struck with an appearance of pulsation in a vein on the back of the hand. Further examination showed a distinct pulsation in every superficial vein of the two upper extremities. The veins were prominent, and their motion was easily seen, but I could not feel it. Some of the pupils in attendance, however, assured me they felt it. The pulsation was isochronous with that of the radial artery, but a little later, following it after

an interval of time, which, when carefully attended to, could be satisfactorily appreciated. I examined the superficial veins of the trunk and lower extremities: they were small and motionless. In the neck the external jugulars were also small; I could not say they pulsated, for there was a tremulous motion communicated to them by the internal jugulars and carotids, which beat vehemently, and prevented accurate observation. The internal jugulars became greatly distended and collapsed during each act of respiration, whilst a confused tremulous pulse incessantly agitated them.

I could learn very little of this woman's previous history; though I sent an intelligent pupil to search it out at her late residence. He could only ascertain that for the last six months she suffered very much from palpitations and headaches; that she was greatly addicted to the use of ardent spirits, and during intoxication had often received wounds on the head; that she was able to follow her usual occupation (selling fruit) until a few days before; and *that she was a Scotchwoman.*

In the evening of this day I took ten ounces of blood from her arm, and was surprised to find that it did not come *per saltum*, although pulsation was observed in some of the veins below the bandage. On looking at the veins, after the bleeding, they seemed to be much more diminished in size than I could have expected from the quantity of blood drawn off, and all pulsation had ceased! This last circumstance disappointed me a good deal, as I had mentioned the case to some medical friends who intended to visit her next morning. The blood-letting was decidedly useful to her; she was less stupid, and the heart's action was less tumultuous.

16th. Still comatose; pupils contracted; she moves all her limbs equally well, or equally ill; shows no sign of intelligence, but is very sensible to stimuli. The veins are collapsed, and totally devoid of pulsation. Pulse in the radial artery 80; rises to 90 when she is roused. Physical signs of the heart's action as at first report.

19th. She continued as on the 16th, with very little alteration, until this morning, when her left arm and leg were found to be flexed, and somewhat rigid. The veins had resumed their distended appearance, and *pulsation was distinctly visible in all as at first.*

My colleagues and the hospital pupils now joined me in observing the pulsations. The veins were seen to rise and fall with the respiration, becoming turgid towards the end of expiration, and flaccid when inspiration was nearly complete. In both states, however, their pulsation went on regularly, beating as often as the artery, 80 in a minute, but a little after it. There was no doubt of this, though the interval was very minute. The stethoscope did not show any change in the cardiac symptoms since the first day's report.

The question as to the *cause* of the curious phenomena before us was now considered, and as the discussion induced us to note more particularly the circumstances of the case, I may briefly state the substance of it.

Two opinions were supported by opposite sides: 1st, that the pulsation was derived from the *left side* of the heart, sending on its blood through the capillaries into the veins; 2d, that it was derived from the *right side* of the heart, and depended on regurgitation.

In support of the former opinion, it was observed, 1st, that pressure on the brachial or subclavian arteries stopped the pulsation, but that it was unaffected by pressing on a vein. 2nd. That the valves acted perfectly, as could be seen by emptying a portion of vein just below a valve, and therefore that regurgitation was impossible. 3rd. That the venous pulse occurred at such an interval after the arterial as was inconsistent with regurgitation, but might be expected if the blood had to travel round by the capillaries. And 4th. That the debilitated condition of the patient might have so relaxed the capillaries as to allow of an unusually free communication between the arteries and veins.

In answer to these arguments, and in favour of regurgitation, it was urged, 1st, that pressure on the brachial or subclavian arteries also acted more or less on the principal veins which accompanied them; besides by diminishing the quantity of fluid which the veins received, it would render their pulsation less evident, in the same way that the bleeding did; but that the free anastomosis would make amends for the slight interruption occasioned by pressing on a superficial vein. 2nd. That though the valves acted well when the vein was emptied behind them, they would not prevent an impulse from being conveyed along a distended vessel; and that, in fact, if each valve were merely thrown suddenly across the venous tube it would cause a pulse, though ever so perfect in its valvular function. 3rd. That the yielding coats of the veins would serve to retard the rapidity of the returning wave, and thus account for the momentary delay in their beat. And 4th. That the arterial pulse was not strong enough to justify us in supposing that it could be continued on to the veins; nor was there any ground for saying that the capillaries were relaxed.

20th. All the phenomena as yesterday. As blood-letting had been attended with some benefit to the patient when practised before, it was agreed to take a few ounces more. The blood flowed distinctly *per saltum*. It was like arterial blood in colour, but of much thinner consistence. The cephalic vein near the bend of the arm was the one selected for the venesection, in order that it might not be influenced by any artery. After the removal of eight ounces the pulsation ceased. The arm was bound up in the usual way, and no motion in the veins of either extremity could afterwards be seen. She died the following night.

Autopsy, twelve hours after death. On opening the chest the lungs were found almost universally connected to the costal parietes by very old and strong adhesions. There was no fluid in the pleura. The lungs were healthy, quite free from disease of any kind; they were not even congested. The *pericardium*

was healthy; it contained a little serum, but not more than is so often seen without disease. The heart was at least twice the usual size. The auricular appendages, especially the left, were remarkably large. The right auricle was dilated, and a little hypertrophied. At the posterior margin of the foramen ovale a particle of osseous matter was observed. The right auriculo-ventricular opening was very large and gaping. The right ventricle was dilated and hypertrophied. Its cavity was twice as large, and its walls twice as thick as usual. The floating margins of the tricuspid valves were thickened and studded with small cartilaginous nodules. The pulmonary artery was healthy, but its valves appeared somewhat thickened, and their corpora sesamoidea much developed. The left auricle was enlarged, its walls thickened, and the lining membrane peculiarly white and opaque. The opening from it into the ventricle was too small to admit the finger; it was an irregular slit-like opening, surrounded with cartilaginous and osseous deposits. The left ventricle was dilated, its walls a little thickened, but softer and paler than those of the right. The mitral valves contained calcareous and cartilaginous deposits. The aortic valves were greatly thickened, and filled with osseous matter. The aorta also had osseous deposits. The superior vena cava, the innominate, jugular and subclavian veins, were slit up, and carefully examined; nothing peculiar was observed in them; their coats were of the usual appearance, and their valves in the ordinary situations. The *abdominal viscera* were healthy. The brain was pale and bloodless; it showed no sign of congestion, nor of any disease except that the ventricles contained about half an ounce of clear serum.

I had one of the arms removed from the body, and carefully injected from the brachial artery. Fine wax, largely diluted with oil of turpentine, and coloured with vermillion was used, but not a particle of injection passed into the veins. The valves of the latter also resisted the passage of a fluid from a trunk to its branches.

I think the *post mortem* decided the question as to the cause of the venous pulsation. The left ventricle was not at all increased in power; its walls, though slightly thickened, were pale and soft; and even if its power were increased, the aorta presented obstacles sufficient to counterbalance that, as was indeed evident from the weakness of the pulse in the radial artery. Injection, too, showed that there was no relaxation of the capillaries. It could not therefore be maintained that the pulse was transferred through the capillaries on to the veins. Again, the veins could not have received their pulse from the right auricle, for their diastole always followed, though at an exceedingly short interval, the diastole of the arteries. Neither was there any thing in the coats of the veins to account for it, nor in the neighbouring arteries. *It is to the condition of the right ventricle we must look for the efficient cause.* This ventricle we find hypertrophied, and the auriculo-ventricular opening dilated; so that regurgitation into the auricle was inevitable; and as this would occur with considerable force, it is easy to conceive how the impulse would be communicated along the dilated veins, even to their small ramifications. The valves intercepted the shock when the veins were flaccid; but in the distended state of the vessels the shock was sent from valve to valve even by the very force with which they were thrown across their tubes. And this may be supposed to take place without any imperfection in the valves, which seemed quite sound. The pulsation following that of the arteries may be explained by the more yielding structure of the veins, which would, doubtless, retard the rate at which the impulse was transmitted.

I find that venous pulsation has very rarely been observed to extend beyond the jugulars. It does not appear that Senac, Lancisi, Corvisart, Bertin, Laennec, or Hope, ever met with such a case. Laennec refers to a paper on the subject in the *Memoires de l'Academie des Sciences*, by Hunauld; but on searching for it no such paper could be discovered. I found, however, a case related by Hombert in the *Memoires* for 1704;

and as Laennec does not mention the volume in which Hunauld's case is recorded, I think it probable he quoted from memory, and mistook the writer's name. Hombert states that the pulsation in the veins *did not correspond* in frequency to that of the arteries; that it was only to be observed during paroxysms of the disease (asthma) with which his patient was afflicted; and that the *post mortem* exhibited great dilatation of all the cavities of the heart, with thinning of their parietes; and large polypi extending from the ventricles into some branches of the aorta and pulmonary arteries. He attributes the pulsation in the veins to *regurgitation* during the morbid palpitations of the heart; whilst the arterial pulse was occasioned by the regular action of the ventricle.

Dr. Elliotson, in a note in Blumenbach's Physiology, says; "In a young lady whom I lately attended for chronic catarrh, accompanied by violent cough, from which she ultimately recovered, *all* the veins of the back of the hands and forearms distinctly pulsated synchronously with the arteries." This is all he says, but from the place where he introduces it, I would suppose he attributed this pulse to the action of the veins themselves. It is in a note to the following paragraph in the text of Blumenbach: "The existence of vital powers in the venous trunks is probable from the example of the liver and placenta, and from experiments instituted on living animals. We formerly mentioned the muscular appearance in the extreme veins near the heart."

In the London Medical Gazette for June, 1832, Dr. Ward relates the case of a woman in whose hands and arms venous pulsation was observed for three days. The patient had lost large quantities of blood for an incipient pneumonia, and was further debilitated by miscarriage. He attributes the pulsation to the "excessive reaction of the heart pushing the thin and impoverished blood through the capillaries straight on into the veins." As the woman recovered there was no opportunity of searching for a more probable cause.

In the fourth volume of the Dublin Hospital Reports we have the details of a case which Dr. Davis saw. The only morbid appearance discovered on dissection was, that the left ventricle was somewhat enlarged, and firmer than natural. He thinks there could be "no doubt of the fact that the pulsation had been continued from the heart through the arteries and capillaries to the veins." But the phenomena which led him to this conclusion were all present in my case, and yet I am sure there can be "no doubt of the fact that the pulsation" depended on a totally different cause.

Dr. Graves mentions incidentally (in the Dublin Journal, Sept. 1834,) two cases of venous pulsation; but he gives no details, nor does he offer any explanation of their cause. From the manner in which they are there brought in, however, we might suppose he thought they depended on the action of the left ventricle. And yet in one of his lectures, published in the Lond. Med. Gaz., Jan. 1831, he seems to advocate the action of *the coats of the veins themselves* as the more probable cause.

These are almost all the notices I find of general venous pulsation; and on reviewing them I do not think they afford any *proof* that it depended either on the force of the left ventricle transmitted through the capillaries, nor on any independent action of the veins themselves. All the arguments in favour of either of these opinions might have been, and indeed were advanced in the case which I have related. And yet the *dissection proved*, I think, incontestably, that hypertrophy with dilatation of the right ventricle, was the true cause.

This case also goes to confirm the opinion of Mr. Adams in the fifth volume of the Dublin Hospital Reports respecting jugular pulsation. I may quote the words of this accurate observer: "There is in all cases a little influx into the right auricle during the contraction of its corresponding ventricle, but the great swelling of the jugular veins is only seen when extraordinary efforts are made, or where, from any enlargement of the right side of the heart, it is capable of containing a larger

quantity of blood than it can readily transmit through the lungs. On these occasions it is that the pulsations of the jugular veins become evident. They are synchronous with the action of the heart, and can more readily take place when the right ventricle has been preternaturally dilated, as it is not likely that the valve will increase in size in proportion as the auriculo-ventricular opening enlarges."

In relating this case I have not given any details of the treatment, because my object was simply to direct attention to the curious phenomena of venous pulsation, and to the explanation which, in this instance, the dissection afforded.

**ART. XIV.—*On the Treatment of Croup.* By DR. KIRBY,
Professor of the Practice of Medicine in the Royal College
of Surgeons in Ireland.**

UNDER the head of Bibliographic Notices in the last number of the Dublin Journal of Medical and Chemical Science, the attention of the profession is very properly directed to a new method of treating croup, pursued by Dr. Lehman, Staff Surgeon at Torgan, and consisting in nothing more than the application of hot water to the region of the larynx at the commencement of the disease. The plan is announced as simple, easily applied, free from injurious effects to the constitution, and efficacious; for Dr. Lehman affirms that it has not yet failed in his hands when seasonably applied, and that it has been used in many cases successfully in several families he attends, before his assistance could be procured.

The simplicity of a remedy often opposes its general reception, and it especially stands a chance of being wholly put aside, when the disease for which it is proposed is one of known severity, of rapid progress, and most frequently of fatal issue. My personal experience for nearly twenty years in the fortunate efficacy of a plan somewhat similar to Dr. Lehman's, gives me the greatest confidence in the report of his successful manage-

ment of this dangerous disease ; at the same time that his authority, and the sanction of our valuable national Journal, encourage me to lay before the profession the treatment I recommend during the first hours of an attack of croup.

Without attempting to assign any cause for the fact, I believe it to be true that there is a disposition to this disease in the children of certain families ; and so strongly has repeated observation fixed such a conviction on my mind, that when one suffers, I think it prudent to examine the other young members of the group, to awaken vigilance, and to take such precaution as circumstances may suggest ; at the same time I instruct the persons in charge in the means to which they should have instant recourse the moment they are alarmed by the peculiar cough and dangerous respiration.

My first advice is, that the neck shall be invested with a bolster of hot salt, sufficiently long to surround it thoroughly, and sufficiently full to fill the whole of the cervical hollow ; a flannel case is to be preferred to linen. When the former cannot be procured, a large woollen stocking will be found to answer as a convenient substitute. Care must be taken that it be not too tightly stuffed, as then it would force the head into a constrained position, and interfere with the action of the laryngeal muscles ; besides it cannot be so conveniently accommodated to the form of those parts with which it is designed to lie in contact. It may be supposed that such an application would be found to be more than cumbersome ; but if it is laid on carefully, and so contrived that its weight shall rest on the shoulders and superior part of the thorax, I can promise that no inconvenience will be experienced. The common salt in use for culinary purposes is that which I have employed ; it should be quickly heated to a temperature of which the hand is impatient ; by the time it is ready for use it will be cooled down to a heat agreeable to our purposes.

This remedy acts very quickly as a rubefacient ; and this effect is produced much beyond the limits of its contact. The face soon becomes full, florid, and the same appearances are

perceptible around the superior parts of the thorax. The temperature of the whole surface of the trunk and extremities is soon increased, the pulse beats with an accelerated stroke, and with a pliancy, fulness, and softness, which gives an unerring promise of a sudden, general, and copious perspiration. When this is established, it is truly astonishing to witness the rapidity with which the uneasiness about the larynx, the almost pathognomonic cough, and the embarrassment of respiration, disappear. The sweat first breaks out around the dry cataplaam; it is next visible on the face and chest, and then it pervades the other parts.

When this perspiration takes place, experience authorises me to say that a triumph over the disease has been obtained. However the remedy is to be renewed rather than laid aside, that the advantage gained may be effectually confirmed. The ordinary means by which perspiration is maintained are here to be employed; the drinks should be rather tepid than hot, and even small quantities of cold water, which is exceedingly grateful, and eagerly wished for, may occasionally be allowed.

The medicine I uniformly prescribe is a mixture of ammonia, saturated with vinegar or lemon juice, and a few drops of laudanum; the doses of which I alternate with two grain doses of calomel and James's powder.

By management of these means diaphoresis may be continued for twelve hours; at the expiration of which period it may be allowed to subside, by changing the application less frequently, and at each time employing a lower degree of temperature. But these remedies should not wholly be laid aside for two or three days, or even for more, should there be any cough, or the slightest trace of any preternatural laryngeal sound. While the perspiration continues I am careful not to risk its suppression by the use of purgatives; but when it has nearly ceased, and the activity of the disease seems to be well controlled, I administer an opening mixture, composed of tincture of jalap, magnesia calcined, electuary of scammony, and water. This combination agrees well with the stomach; acts in small doses;

its operation is more certain than any other medicine I am acquainted with. The discharges are sufficiently abundant, and the whole business is soon at an end.

The cough, which sometimes continues for a few days, appears to me to be best treated by low diet and mucilaginous mixtures, to which squill, hippo, and laudanum, are sometimes added with much advantage.

Was it not for a note signed R. J. G. appended to the article, by which I have been induced to offer these observations, the last paragraph would have included all I had to say with reference to Dr. Lehman's mode of practice. But the matter which that note contains is of too much importance to be passed by without the notice to which the authority from which it emanates is most justly entitled. The annotator advises the instant abstraction of blood from one or both arms, or from the jugular vein. Now, I am perfectly convinced the rule which is thus delivered is expressed with too general an application. I am quite aware of the value to be attached to the abstraction of blood under certain circumstances, at the same time experience assures me such a decisive remedy may be employed to the frustration of that secretion, on the perfect formation of which the removal of the early stage of the disease decidedly appears to depend. Venesection is no doubt a powerful agent in all inflammatory complaints, and in none is its virtue more completely displayed than in those engaging the pulmonary apparatus, such terms being taken in their most comprehensive signification. Yet still it may be prematurely prescribed, and I believe the reliance reposed on its efficacy not uncommonly disturbs a curative function, which the skin is disposed to perform. The sanatory effects of perspiration in sudden diseases affecting any part of the respiratory apparatus are so sufficiently established, even in vulgar opinion, not always despicable, as to make it unnecessary to do more than allude to a few examples in which its efficaciousness seems to be signally displayed.

One man who has a casual cold "upon his chest," as it is said, exercises until he is heated and perspires, and he returns

relieved from the malady with which he set out. Another who has long had some chronic catarrhal affection, feels his chest "tight, he expectorates less than usual, and his breathing is embarrassed;" he sets out to walk, or uses his horse with activity, and thus forcing a perspiration, is also relieved of his inconvenience. The asthmatic person knows the importance of a copious sweat, and I say our remedies are of little use except so far as they contribute to produce it; additional covering on the front of the chest removes many a trifling pulmonary affection, and shields the wearer against attacks to which he had been previously much exposed. Females of fashion seem almost intuitively impressed with the susceptibility to which their costume makes them liable. We smile at the flimsy protection they use to shield themselves from inclemency of season and sudden changes of temperature, without reflecting upon the defence which the open texture of the material they employ for the purpose is accidentally calculated to secure.

For the reasons assigned, confirmed by a knowledge of the power which venesection exercises over all secretions, I abstain from its use in the commencement of the attack. If the means I here strongly advocate disappoint expectation, and that the lungs participate in the disease, I am sure the attendant distress will be alleviated by a full bleeding, and the skin may probably be thus brought into a state permitting a wholesome degree of diaphoresis. I remember a remarkable instance quite to the point. A fine child of seven years of age, and of unusual obesity, suffered from the highest inflammatory stage of croup, when I was called to perform venesection, which had been several times attempted to be performed by the persons in attendance. After so many failures, and in a patient of so great corpulency, I doubted my success, and I suggested to the father that venesection being impossible, I should be permitted to open an artery. I selected that upon the instep, then beating with a prominent force. A large bleeding was taken; diaphoresis soon followed, and the alarming symptoms rapidly disappeared. Great heat at the surface of the body, with much frequency of

the pulse and hardness, are the circumstances which warrant this evacuation, and according to which its amount should be principally proportioned. It is true, venesection brings relief, and the consequence is, a repetition is advised when the same distress which it previously removed has again returned. It is also true, the disease is pronounced inflammatory, and perhaps it is right to take such a view of the subject. However, of this I feel assured, that in the management of this disease the abstraction of blood, whether by the lancet or by leeches, is often carried to an injurious, not to say a fatal extent. In truth, was the croup to be cured by the whole cohort of antiphlogistic measures, the grave would have been deprived of many an inmate which it now embraces. The record which every person of experience carries about him proclaims the insufficiency of the means he recommends. Can it be that the antiphlogistic plan is not carried to a sufficient extent? I cannot but doubt the force of the objection which such a question conveys, and so, I think, will every one who has the power of taking a calm review of his own experience. The most powerful depletory agents have been employed in every degree, and we may almost say, in every stage of the disease, without any result from which confidence in the practice can in future be derived.

Emetic tartar being mentioned by the talented annotator as a remedy to be used after venesection, I cannot close the notice I have been induced to take of the treatment by Dr. Lehman, without an expression of its influence on croup. Like venesection, when too early employed, it withholds diaphoresis of a warm, salutary character, while it promotes a moisture on the surface, which to the hand feels thin and cold, thus giving proof of the obedience of the system to its depressing influence, against which the remaining powers of reaction in vain contend. In the antiphlogistic pressure of either venesection or tartar emetic, I confess, and must say, I have no confidence.

Leeches and blisters are often the resource of men who are in the habit of pursuing a practice of routine. I have never seen these means decidedly useful. When timidity restrained the lan-

cet, I have known the former to be prescribed in such ill-judged numbers that the child died of hemorrhage almost before the leeches were disengaged. If action on the skin be at any time necessary, the more sudden the means by which it is produced the better; the delayed action of a blister is an insuperable objection to it. In croup its action is never beneficial, and I dare to say, no one will be found so bold as to assert that even one single fact can be found to establish the propriety of the continuance of their use. For my own part I will never prescribe them, while there are means within my reach by which the skin can be more suddenly and as strongly acted upon. The value of what is commonly called a counter-irritant is strongly displayed by the brief statement which follows. A boy of two years of age was brought to me to hospital in the arms of his mother, in the advanced and most unpromising stage of croup. I saw him in the hall at a time when I was surrounded by my pupils; I pointed their attention to the disease; I said I had no hope, and yet I would try an experiment. I procured a piece of lapis infernalis, and applied it extensively to the back of the neck, as if I designed to establish a large issue; I shall only add that the boy was quickly relieved, and rapidly recovered from the extreme danger in which I perceived him to be placed.

Mercury is a remedy upon which I am induced to say reliance cannot be reposed. To wait for its effects is to waste time of precious value. I never saw an instance in which it produced any change in the disease, although given in every proportion of dose, and in all its forms of application.

I shall close these remarks by observing, that I never saw a case in a child, of twelve hours' duration, which did not resist all the usual remedies of routine. If candour extracts a similar confession from persons of extensive opportunity, it is surely high time to pass from a fruitless track, and to start into a new course. That which I recommend is however suited only to the period of invasion. I know of none equal to control the more confirmed stage of this disease.

BIBLIOGRAPHIC NOTICES.

Pathological Researches on Phthisis. By E. CH. A. LOUIS. Translated from the French, with Introduction, Notes, Additions, and an Essay on Treatment. By CHARLES COWAN, M. D. &c. 8vo. pp. 388.

We can scarcely appreciate the extent and value of our knowledge of phthisis now, unless we look back to the books that were published in this country not fifty years ago. Cullen in his *Practice of Medicine*, the standard authority of that day, *presumed* that consumption depended on an ulcer in the lungs; and even the learned Young, who published so lately as 1815, and had the advantage of Bayle's elaborate work, affirmed, that though we could not certainly say what the causes of phthisis were, we could say what they were not. In fact though Bayle added much to our knowledge, yet in consequence of his numerous divisions into cancerous, calculous phthisis, &c. he left the subject in some degree of confusion; and it is chiefly to Laennec that we owe the first clear and distinct conception of the disease.

The present is the most complete work on the pathology and symptoms of phthisis yet published, and the author, in spite of all that has been done by others, has, by a combination of indefatigable industry, with a talent for observation rarely possessed, contrived to add much to the (apparently exhausted) pathology, and put our means of diagnosis on a footing more certain than the most sanguine could have hoped for. The translator, who has ably done his task, for which he appears to have been peculiarly fitted, having attended hospitals in Paris for four years, and during twelve months of this time been a diligent disciple of Louis, and has contributed much to the value of the work by his judicious notes and observations, gives the following account of Louis' labours, which will best set forth the strong claims the book has to our attention.

" For nearly *seven years*, including the flower of his bodily and mental powers, (from the age of thirty-three to forty), he (Louis) consecrated the whole of his time and talents to *rigorous impartial observation*. All private practice was relinquished, and he allowed no considerations of personal emolument to interfere with the resolution he had formed. For some time his extreme minuteness of inquiry and accuracy of description were the subjects of sneering and ridicule, and *cui bono* was not unfrequently and tauntingly asked. The absence of any immediate result seemed for a time to justify their contempt of a method, involving too much labour and personal sacrifice to be generally popular or easily imitated; and M. Louis himself, at moments almost yielded to the increasing difficulties of the task he had undertaken. No sooner were his facts sufficiently numerous to admit of numerical analysis, than all doubt and hesitation were dissipated, and the conviction, that the path he was pursuing could alone conduct him to the discovery of truth, became the animating motive for future perseverance. Many of the results to which he arrived soon attracted general attention; and among those who had formerly derided his method, while they admired his zeal, he found many to applaud, and a few to imitate him."

It will be seen from the above that the plan Louis adopted is what is called the numerical method. A great number of cases are collected, their minutest points carefully noted down, all theoretical bias being carefully excluded from the mind, and when the number is considered sufficient, conclusions are drawn, and the relative frequency of facts remarked and compared. This is described by the translator in the preface.

" But observation, however extended and exact, is of itself insufficient to generate conclusions, for collected as our facts must have been, through a series of months and years, and consisting of an infinite variety of details, no memory could recall, and no mind could grasp, their complicated relations with each other. To accomplish this, the '*numerical method*' is necessary, that is, *counting* the number of all the individual facts, comparing their relative frequency in cases of a particular class, and then determining their real value by a comparison with facts of other classes which have also been reduced to similar elements. This is the plan pursued by our author, and which must be adopted by all who seek to establish truth and arrive at general results."

This method, though often neglected, can scarcely be said to be new, all great physicians, from Hippocrates down to the present day, have probably pursued this plan of studying disease, and we need scarcely refer to Andral's admirable "*Clinique*;" but perhaps no one has ever carried it to such an extent as our author, and certainly none ever manifested more ardour or perseverance in the pursuit.

"How otherwise," the translator observes, "could we have ascertained that tubercles in any organ of the body, after the age of fifteen, involved their presence in the lungs? That phthisis almost invariably commences in the upper lobes? That it is more frequent in women than in men? That pneumonia is more easily resolved in a tuberculated than in a healthy lung? That simple bronchitis commences at the base of the lung, pursuing a course inverse to that of phthisis? That chronic peritonitis indicates pulmonary tubercles? That acute affections, when free from complication, are generally confined to one side of the body, or one part of an organ, if single? How could these and many other results be obtained but by rigorous observation and numerical analysis."

The work commences with the pathology of phthisis. He agrees with Laennec that "the existence of tubercles in the lungs is the cause, and constitutes the special character of phthisis;" but examined with the most minute attention every organ in the body, and compares the effects of this disease with the effects of other chronic diseases on them. He says,

"It is sufficiently obvious, from what has preceded, that the pulmonary organs were not the only ones whose functions were impeded, but that others were the seat of extensive morbid alterations, alone sufficient to produce death; and that they all contributed to hasten the catastrophe."

To attempt even a summary of these alterations would lead us beyond the limits allotted for criticisms in this periodical, we shall therefore present as a specimen of the whole, and a most important part in itself, the pathology of the epiglottis, larynx, and trachea.

"Of these three continuous organs, parts of the same apparatus, analogous in their structure, and susceptible of the same alterations, the larynx alone has attracted the attention of observers in the history of phthisis. Its ulcerations have been described, but those of the epiglottis have been scarcely mentioned, and those of the trachea almost entirely overlooked. The cause of this omission is no doubt owing to the fact, that there are frequently no symptoms whatever to announce this alteration, and also to the practice among medical men of examining those organs only whose functional derangement was more or less prominent during life. Be this as it may, the ulcerations of the epiglottis are not uncommon in phthisis; they are indeed almost as frequent as those of the larynx, for in 102 cases in which the respiratory tube was carefully examined, they existed, with those of the larynx and trachea, in the proportion of 18, 22, 31.

"*Ulcerations of the Trachea.*—When the mucous membrane of the trachea was ulcerated it was generally of a bright red colour. Sometimes, however, and especially when the number of ulcerations was inconsiderable, it retained its natural whiteness. This was the

case in six out of the thirty observations where we have remarked the alteration alluded to ; and one of them was an example of very extensive ulceration ; it is in the lower half of the trachea, that is, in that portion of it where ulcerations are the largest and most numerous, that the redness was most strongly marked. There were associated with it, in about one-fifth of the cases, a slight thickening and inconsiderable softening of the mucous membrane.

" When the ulcerations were small, they were usually equally scattered throughout the circumference of the trachea ; they were of a round or oval form, varying from a line to a little more or less in diameter ; the mucous membrane round their edges was destroyed, their bottom formed by the cellular tissue slightly or not at all thickened, their edges flat, and their general appearance that of being artificially produced. It is now easy to conceive how these small ulcerations, with their flattened edges and pink colour, should have escaped notice, when the trachea was not minutely examined, or previously washed. If their dimensions were more considerable, they were unequally distributed ; the largest were found in the fleshy portion of the trachea. The mucous membrane retained in their vicinity, as also in that of the smaller ulcerations, the thickness, colour, and consistence which it possessed in the rest of its surface. The sub-mucous layer, indurated and thickened, formed their lining, or even this was either totally or partially destroyed, and the muscular coat exposed in the corresponding point. This last tunic, when thus denuded, was in two or three instances thicker than natural, and in a small number of cases we found it more or less deeply ulcerated.

" A certain number of the cartilaginous rings were sometimes denuded, diminished in thickness, and either partially or wholly destroyed. This last alteration we have only observed twice, while we have seen in five cases the complete destruction of the mucous membrane of the trachea, throughout almost the whole of its fleshy portion.

" The preference which the large ulcerations almost always exhibit for the posterior portion of the trachea, may perhaps find a solution in the constant passage of the sputa, and their more or less prolonged contact on this particular part. For, if too exciting liquids produce inflammation and ulceration of the mucous membrane of the stomach, we might expect the same effect on the trachea from the no doubt irritating influence of the excreted fluid. Besides it would be difficult to explain on any other grounds why the ulcerations of the epiglottis exist (as we shall prove farther on to be the case) only on its lower surface, the one most frequently in contact with the sputa.

" But while we admit that the expectorated matter may have a decided influence both as to the extent and seat of the ulcerations of the trachea, we must recognize also some other cause ; for they are far from being always in proportion to the irritating properties of the expectoration, nor do they constantly exist even when the affection of the lungs is considerable, and the tubercular excavations of long

standing. We may also add that the bronchi, in which the expectorated matter circulates and remains a greater or less time, are less frequently (we have only found it seven times) the seat of ulceration, than the trachea. It is, however, possible that this number is under-rated, for, with respect to the present subject of inquiry, we have never examined the bronchi with the same attention as the trachea. In one-third of the cases where this organ was free from ulceration, its mucous membrane was of a red colour, increasing in intensity as you approached the bifurcation. It was still more marked in the muscular portion than elsewhere, so that it pursued the same course as the ulcerations, and no doubt partly depended on the contact and retention of the sputa in the trachea.

“*Ulcerations of the Larynx.*—These were, as we have already remarked, less frequent than the preceding, seldom unaccompanied by them, and presents, in one-fourth part of the cases. Twice only we have observed them alone, and in many instances they sensibly varied in their characters from those of the trachea. Seldom superficial, or presenting the appearance of artificial formation, they were generally of a certain depth, more or less irregular, and from one to two lines broad. Their edges, of variable consistence, were sometimes lardaceous, of greyish or whitish colour. The mucous membrane was pale, and perfectly sound in the rest of its extent.

“The most frequent seat of the ulcerations was first the junction of the vocal cords, where they were sometimes superficial; then the vocal cords themselves, especially their posterior part; we have only once observed a very small ulceration at the base of the arytenoid cartilages, the superior part of the larynx, and the interior of the ventricles. In some instances, one or more of the vocal cords were completely destroyed, and the base of the arytenoid cartilages laid bare. When this was the case, the cartilages themselves were unaffected.

“*Ulcerations of the Epiglottis.*—We have remarked these eighteen times, or in about one-sixth of the cases, and five times unaccompanied by those of the larynx and trachea. This complication, however, existed in the other cases, so that all the examples of ulcerations enumerated in this and the two preceding paragraphs, have been collected from forty-four cases, about four-tenths of those whose history we are now analyzing. Sometimes superficial, the ulcerations of the epiglottis were generally of a certain depth, not, however, (with two exceptions,) penetrating to the fibro-cartilage beneath. The mucous membrane surrounding those which were superficial, did not appear evidently thickened; when the ulcerations were deep, it was rather harder and thicker than in the natural state, either in the immediate vicinity, or in the intermediate space. It was sometimes of a rose colour, and in many instances the layer separating it from the fibro-cartilage was more or less puffy in its texture.

“The ulcerations existed, as we have already remarked, almost solely on the laryngeal surface of the epiglottis, and most frequently on its lower half. Once only we encountered them on its lingual surface. Their dimensions were from one to two lines, often larger.

In some cases the mucous membrane of the epiglottis was destroyed over the whole extent of the inferior surface. In others the cartilage was destroyed in portions of its circumference, giving a festooned appearance to the epiglottis. This we have seen four times. A fifth case has presented an example of complete destruction of the epiglottis.

“ We have in no one instance discovered tuberculous granulations in the substance, or on the surface of the epiglottis, larynx, or trachea; inducing us to believe that we ought to consider inflammation as the most frequent cause of the ulcerations.

“ Another fact of importance to remark is, that these ulcerations were twice as frequent in men as in women; thus in an equal number of cases the women only presented six examples of this state of the epiglottis, seven of the larynx, and nine of the trachea, out of eighteen, twenty-three, and thirty-one cases; and as the proportion is nearly equal for the three kinds of ulcerations, it is probably not the effect of hazard. In making an accurate summary of the state of the epiglottis, larynx, and trachea, in cases terminating fatally from some other disease than phthisis, (particularly chronic affections), we have found in *one hundred and eighty instances*, one example of ulceration of the larynx, and two others, when both the larynx and trachea were similarly affected. In the first case, the patient had died of pneumonia, and the lungs presented no trace of organic ulceration. In the two last they died of cancer and softening of the brain, and had tuberculous cavities in the lungs. From what has preceded, it follows that we must consider the ulceration of the larynx, and especially those of the trachea and epiglottis, as alterations peculiar to phthisis.

“ With the exception of three cases of œdema of the glottis, the changes we have described are the only ones these organs have presented to us in phthisical patients.”

Louis is decidedly opposed to the notion of the inflammatory origin of tubercles; and from the careful examination of numerous cases has come to the opinion, so strongly advocated by Laennec, that neither pneumonia, pleuritis, or bronchitis, have the effects alleged by Broussais and others. For the seat of pneumonia and bronchitis is generally at the lower part of the lung, the reverse of tubercle, and both lungs are almost always the seat of tubercles; whereas both pneumonia and pleuritis are in the majority of instances confined to one. The sex also (female) most exposed to phthisis is least frequently attacked by pneumonia and bronchitis. Indeed whoever has read Broussais' remarks on this point must allow the justice of Laennec's observations, that he supports his opinion more by reasonings and assertions than facts.

The second part of the work is allotted to the symptoms, treatment, and causes of phthisis. A general description of the disease is first given, and then each prominent symptom examined separately. Following the example of Laennec he di-

vides phthisis into two principal stages; the one anterior, and the other subsequent to the softening and evacuation of the tuberculous matter by the bronchi. This appears a simple and natural division, and we prefer it to the threefold one lately adopted by Dr. Clarke in his excellent paper on this subject. The duration of the disease was very variable; this is shown by a table, of which the following are the results:

“ Out of 114 cases, the duration of which has been determined as accurately as possible, rather more than two-tenths have died, from the first to the sixth month of the disease; four-tenths from the sixth to the twelfth month; rather less than a fourth from the first to the second year; and less than one-fifth from the second to the twentieth.”

Louis considers that age, except perhaps in some instances of acute phthisis, has little influence on the progress of the affection. From this opinion we are inclined to dissent, and rather agree with Drs. Clarke and Armstrong, that it does exert considerable influence on its progress. Most of the very chronic cases that we have seen have been in old people, chiefly old men. On the other hand he allows the influence of sex, the progress of the disease being more rapid in women, a fact he thinks explainable by considering that the adipose state of the liver, and the softening, with diminished consistence, of the gastric mucous membrane, were much more frequent in them.

“ As to the comparative mortality from phthisis, it was nearly as one to two; for out of 358 fatal cases in the wards of M. Chomel, during three years and a half, 123 were phthisical, the remaining 235 including a variety of other diseases. And if to this number of phthisical cases, we add those who, while dying from some other disease, presented tubercles in the lungs, (viz. 40), we find that out of 355 cases, 160, or nearly half, presented pulmonary tubercles, and were really consumptive! This proportion is immense; it does not however include a comparison with all those cases which are necessarily fatal in the actual state of our knowledge.”

The first symptom examined in detail is cough, the next haemoptysis, which is of such importance that we need not apologize for the length of the extract.

“ *Hæmoptysis.*—It was present in two-thirds of the cases, fifty-seven times out of eighty-seven.

“ By copious hæmoptysis, we understand the expectoration (in a few minutes, quarter of an hour, half an hour, or an hour) of several ounces of more or less liquid sputum blood, occasionally dark-coloured and coagulated, and sometimes accompanied with contractions of the diaphragm, which induce patients to suppose they have vomited.

Hæmoptysis is inconsiderable when a few mouthfuls of frothy blood are rendered either pure, or mingled with the expectoration. This may be repeated for several months successively. Either kind seemed equally frequent. Out of fifty-seven patients, the hæmoptysis was copious in twenty-five.

“Copious or otherwise, it sometimes preceded both the cough and expectoration. This was the case with twelve of our patients, and in eight out of these the hemorrhage was copious. The quantity was more frequently abundant (in the proportion of nine to seven) in the course of or at the commencement of the first stage of the complaint. Bloody expectoration was rare towards the termination. We have only observed it in four cases, twice copious, and twice in small quantity.

“Are we, however, to consider copious hæmoptysis which preceded the cough and expectoration as the precursor of tubercles, or simply as a symptom which reveals their presence? For nearly three years we have constantly questioned every patient under our care, and who was attacked with some other disease than phthisis, if they had ever spit blood? and we have invariably received answers in the negative, except where external violence had been received on the chest, or where the catamenia had been suddenly suppressed. Patients subject to bronchitis during many years, and whose breathing was usually free, had never had hæmoptysis. On the other hand, we have seen some individuals with tubercles in the lungs, who had never experienced any direct symptom announcing their presence; so that we ought not to feel at all surprised that pulmonary tubercles should give rise, at a certain period of their existence, to a single symptom, and in particular to expectoration of blood. We therefore think that hæmoptysis, (with the exceptions already mentioned,) whenever it occurs, renders the presence of tubercles in the lungs infinitely probable. We bound our conclusion to probability, for many well-attested facts appear fortunate exceptions.

“Analogy, moreover, is in favour of what we advance. *For, when hemorrhage occurs in any internal organ it is almost constantly a symptom of more or less considerable alteration of structure.* Let us add also, that when hæmoptysis preceded the other symptoms of tubercles, it was occasionally followed by dyspnoea, came on suddenly, usually when the patient appeared in perfect health, without previous phenomena, or any apparent cause; and it is not unnatural to suppose that the then concealed cause was identical with what subsequently reproduced the symptom.

“But we shall confine ourselves to these few reflections, which are rather indulged in to excite examination, than to supply facts.

“Sex had an evident influence on the occurrence of hæmoptysis. It was more frequent in women than in men, in the proportion of three to two. Thus, out of forty-two women who were carefully questioned on this point, thirty-six had expectorated blood; but out of thirty-eight men, it was so with only twenty-one.

“The proportion of hæmoptysis in different ages was not the same in both sexes. One-third of the female patients, between the

ages of nineteen and forty, had not experienced it; while from forty to sixty-five, it was only absent in one-seventh; an inverse proportion of what ought to have existed, if, according to the opinion of some physicians, haemoptysis may be considered in some cases as a supplement to diminished or suppressed catamenial discharge.* In men, on the contrary, the proportion was exactly similar, either before or after the age of forty; so that out of twelve cases above this period, six had expectorated blood; and out of twenty below forty, fourteen. The age seemed without evident influence on the quantity of blood expectorated; and the frequency of its recurrence seemed depending on the duration of the disease.

"We have also endeavoured to decide whether there existed any connexion between the strength or weakness of the general constitution and haemoptysis. Out of forty-eight cases both these conditions were equally present, though among the women there was a predominance of *robust constitutions*.

"In some instances copious haemoptysis only occurred once; it was seldom repeated three, four, or a greater number of times.

"In some rare examples haemoptysis seems to have been produced by a paroxysm of coughing. It almost always occurred without any assignable cause, and was seldom accompanied with either a sense of heat or pain in chest, or any variation in the state of the pulse."

With respect to the pains so often complained of, he says:

"We find that thoracic pains corresponded with the adhesions of the lungs to the pleuræ, and not with the dimensions or number of the excavations. They appeared to result from adhesions formed by chronic inflammation of the pleuræ, and when these were bounded to the summit of the lungs no pains were experienced, although the excavations were considerable. We may add that age, which seemed without influence on the progress of phthisis, had a very sensible effect on the duration of pain."

He considers the lesion of the lungs as the cause of the hectic fever:

"Since fever frequently commenced in the first stage of the complaint, or even from its beginning, that is when the lungs were still the only organs affected, we must conclude that its principal, and often only source, was the more or less extensive alteration in the respiratory organs.

"The shiverings were generally followed by heat and perspiration. We say generally, for perspiration was absent in one-tenth of the examples; and on the other hand, they sometimes existed with-

* The translator judiciously observes in a note, "It would appear to us that the age from forty to sixty-five was most liable to menstrual disturbance; which, if not usually so violent as at an earlier period, is at least more general."

out rigors; this was principally during the night, when the patient was asleep. The perspirations were so copious and inconvenient in some instances, that sleep was dreaded. They did not appear to depend on the state of the other organs, and generally coincided with the diarrhoea, being frequently most abundant when the alvine evacuations were numerous. We have purposely multiplied our questions, to discover whether any dependance existed between the phenomena, if they were not supplementary of each other; we have never succeeded in affording ourselves proofs of the *balancement* of our functions insisted upon by others. We have distinctly observed, in the course of perspirations, more or less copious, that the diarrhoea diminished during two or three days; but it soon returned with its previous violence, proving that its variation was a simple coincidence, and not a consequence of the state of cutaneous perspiration."

The contrary opinion to the foregoing is so general, that we think Louis' remark on this head particularly valuable, having not unfrequently heard objections raised to any plan of treatment for checking the perspiration, lest diarrhoea should take its place.

"*Diarrhaea*—was so frequent, that we feel justified in considering it rather as a symptom than a complication, and shall consequently not defer its consideration. Out of 112 cases, five only had no diarrhoea. It presented numerous gradations of intensity and duration. In one-eighth of the patients it commenced with phthisis, persisting until death, having lasted from five to twelve months. In some of those who died after an illness of four or five years, it was almost constant during this long period of time. In the majority of cases, it commenced in the second stage of the affection, in others towards the very close of the disease: so that we could consider it under two principal points of view, viz. when it occurred towards the close of life, or when it dated from a period considerably anterior to death."

The following observation is especially worthy of attention:

"To be able to predict, with some certainty, the existence of large and numerous ulcerations, it is not only requisite that the diarrhoea has been chronic and continuous, but that the stools have been frequent; for in many instances when this last condition was wanting, although the diarrhoea had continued many years uninterruptedly, the ulcerations were very inconsiderable. But we have never met with an example when the diarrhoea was chronic, continuous, and when at the same time the stools were numerous, without large intestinal ulcerations.

"The certainty of the diagnosis would be still further increased by the evacuations. For in accordance with what we have remarked in the former part of this work, their colour was greatly changed, and their odour similar to that of some animal substance, some time in maceration, when the ulcerations were extensive and numerous.

"If those in the rectum were small, they exerted no influence

on the diarrhoea. If they were extensive, and particularly if situated close to the arms, the dejections were extremely frequent; mucus, accompanied with tenesmus, sometimes streaked with blood, and generally involuntary. The loss of strength and flesh was also proportionate to the number and frequency of the stools."

He believes that

"Loss of flesh can furnish to the physician very useful indications as to the diagnosis of latent phthisis; that is, when the patients, without experiencing any local symptoms, are harassed by continued fever of some duration, and accompanied with dyspnoea and emaciation. Under these circumstances it is rare that the seat of the disorder is not in the lungs, and the affection tuberculous. It is an additional reason, to have recourse to all the means in our power to discover the exact state of the lungs."

The diagnosis of phthisis, latent and acute phthisis, and sudden deaths, are all treated of in so admirable a manner, that we should regret not being able to extend our extracts further, did we not feel confident that few medical men will be long without this excellent work; indeed every one who wishes to obtain a perfect knowledge of phthisis should possess it; as it is not only a book to be read through, and then laid aside, but one for a constant reference, being a complete compendium of all the facts relating to this disease.

The Cyclopædia of Anatomy and Physiology. Edited by
R. B. Todd, M. B. Parts I. and II.

Most of our readers are probably already acquainted with the nature and objects of this publication; those who are not should know that its object is to place in the hands of the teacher, pupil, and practitioner, a series of essays on the different branches of anatomy and physiology, alphabetically arranged, and so constructed that they may be referred to with confidence as, at least, an epitome of what is known on the subjects treated. A work of this character has been a desideratum, the progress of knowledge on these topics being greatly retarded by the want of a uniform plan of instruction, which writers and teachers might adopt even partially. As we are most anxious to forward the views of the editor in this praiseworthy undertaking, it should be understood that any observations we hazard respecting faults or deficiencies in the work are intended as friendly hints toward its improvement in its progress.

The first article is by Dr. Todd himself, on the Abdomen; it is a good, plain, matter-of-fact, anatomico-chirurgical view of the cavity, as it is described by the best teachers in the lecture and dissecting rooms, containing a detailed description of the muscles, fasciæ, parts in hernia, relative anatomy of vessels, &c., with a well condensed view of the uses and application of the muscles, as connected with the functions of the contained viscera.

The next is an article on Absorption, by Dr. Bostock. We object to the occupation of eight columns by a description of the absorbents, not apparently destined for this part of the work; he wastes time and labour of great value upon matters to be dealt with by practical anatomists only. The remainder of the article is such as might be expected from Dr. Bostock's established character as a physiologist. The arguments respecting venous absorption are summed up and contrasted, the action of the absorbents considered, cutaneous absorption particularly noticed, and the relation of the absorbent system to the other vital functions discussed.

The next is the article *Acelepha*, by Dr. Coldstream, a very appropriate name for a contributor to the history of aquatic animals. Some of our old friends, whose schoolboy days are long passed, may be startled at the heading of this article, and puzzled to know what acelepha means, especially if their pursuits have fastened them to *terra firma*. They may however be familiar with some part of their history, as sea nettles, Portuguese men of war, *Medusæ*, *Beroes*, &c. In a physiological point of view they are important, as affording specimens of animals, some of them little superior in vitality and organization to vegetables. Dr. Coldstream describes the state of the different functions in these animals under the heads of sensation, digestion, respiration, circulation, &c., to which the eye of the student should be directed; who must not however be deterred from the perusal by the formidable array of hard words introduced to determine zoological characters; a part of the subject which we are inclined to think misplaced in a work of this description.

Acrita, by Mr. Owen, however valuable for a dictionary of natural history, and we are fully aware of the value of any communication of his, we must perhaps also consider rather misplaced.

The subject of Adhesion, usually dealt with in surgical works, is discussed by Mr. Phillips; its introduction here is not injudicious; it is a natural process analogous to that of growth, and not allied to morbid action. *Adepocire* is disposed of by Mr. Brande in one column, or about two pages of common octavo.

Adipose tissue, described by Dr. Cragie, contains most of the facts recorded respecting this secretion, and perhaps more than the facts, when he quotes M. Raspail's microscopic *discoveries*. We entreat of Dr. Cragie not to quote Bichat for statements purloined from Haller. He knows well, for he has obviously read it, that the article on this subject in Haller's *Elementa Physiologiae* is the best on the subject.

There is an interesting and instructive article, as far as it goes, on the subject of Age, by Dr. Symonds, being an account of the changes in structure and function in the different parts of the body, from birth to old age. Albino, by Dr. Bostock, has actually as much space devoted to lists of authors on the subject, as to the subject itself; we would suggest, that authors of articles should state honestly the names of those authors whom they have really consulted, and then give a list of authorities from the usual sources. Albumen is disposed of by M. Brande in a satisfactory manner. The article Amphibia is by Mr. Bell, it is a long one, but not too long, as we cannot point out any thing that should be omitted. No man can pretend to a knowlege of physiology unacquainted with the life and organization of this class; they afford abundance of peculiarities and departures from arrangements adopted in mammalia and birds. Mr. Bell gives his own arrangement of this class of animals, which we regret, not because we object to that arrangement, but that this is not a place to promulgate novelties of this nature. Students must have some one uniform system for reference, whether it be good or bad.

The last article of the first number is by Dr. Grant, on the Animal Kingdom, an introductory essay to a series of articles to follow from his pen, and an earnest of a fund of information in comparative anatomy. We must, however, express a belief that the subject has not received that attention from the profession which warrants his mode of treating it: he should be less transcendental, and more intelligible to persons moderately informed. There is too much of elaborate zoological nomenclature and system making. This we say, however, as a hint to Dr. Grant, not as discouragement to the student from the perusal of the article. Although he may not comprehend all contained in it, he will assuredly find himself much better informed after than before he has read it twice over. The subject is admirably illustrated by a profusion of woodcuts, so numerous indeed, that we tremble for those who are to bear the expense, relying on the taste and spirit of those members of the profession who cultivate such pursuits.

The next is the article Animal, by Dr. Willis, an introductory essay on life and organization, affording a sketch of the

subject, creditable to the author, and worthy of the perusal of either student or teacher. The next is an article on the Ankle, separated with much pedantic pomp and circumstance into two, Ankle, Region of, and Ankle, Joint of. The former purports to convey the necessary information respecting the surgical and relative anatomy of these parts, the communication of which does not require any very great exercise of ingenuity or depth of learning, yet we cannot say that it satisfies us ; especially as the production of a person who professes to teach anatomy in a city which has acquired some character for the cultivation of this very branch of the science. A character which we are determined to uphold as far as in us lies, and will therefore visit with the full measure of our editorial authority, any slovenly production calculated to compromise it. The description of the skin and cellular membrane occupies nearly two columns, while the nerves are disposed of cavalierly in six lines, to afford the writer an opportunity of displaying his surgical attainments, a practice much adopted by some teachers who find it more convenient to make prosing digressions than elaborate demonstrations : the other article on the ankle joint is equally deficient. The writer does not understand the mechanism of the joint. He says, "the motions of flexion and extension are the only ones permitted at the ankle joint." Now the ankle is a beautiful example of the circumscribed universal motion, attained by modification of the simple hinge. We should like to see a man walk with ankle joints admitting of flexion and extension only. What is the use of the peroneus, longus and brevis, the tibialis anticus and posticus ? This subject must be taken up again and mended under some other head.

Mr. Adams compensates for the deficiencies of the preceding article by a valuable account of the injuries and diseases of the ankle joint, illustrated by several woodcuts, and including dislocations and fractures, and acute and chronic inflammation. This is no schoolboy compilation, but a judicious analysis and condensation of previous knowledge, corrected by personal observation and careful dissection, and a good specimen of the manner in which anatomy and surgery are studied in connexion in Dublin.

The next is *Annelida*, by Dr. H. M. Edwards, of Paris, an admirable account of those animals, of which the leech and earthworm afford examples every day before our eyes. He describes the zoological characters, and adopts an arrangement not very different from that of Cuvier. The external configuration, organs for sensation, nervous system, digestive organs, circula-

tion, respiration, and generation, are described in detail, and illustrated by excellent wood engravings.

Under the head of Anus, the student is presented with a valuable account of the surgical anatomy of this important part of the body from the experienced hand of Professor Harrison, prefaced by a brief notice respecting the outlet of the alimentary canal, as it appears in the different classes of animals. This article may be studied with equal advantage by the student in the dissecting-room, or the practitioner previous to operation. At the termination, the surgery of this part and its vicinity is presented in a condensed form. The editor however must speedily make up his mind as to the extent to which practical surgical observations, not necessarily arising out of the subject, are to be introduced, otherwise he may perhaps be compelled to call the book a Cyclopædia of Anatomy, Physiology, and Surgery. We do not however object to writers mixing up surgical observations with the anatomical descriptions; unless the relation of minute parts to each other be pointed out for the purpose of directing the knife, or guiding the practice of the surgeon, it is a tax on the memory of the student worse than useless.

The article on the Aorta is by Dr. Hart, another Dublin anatomist; it is correct, precise, and methodical, and obviously the production of one who, having read and dissected, modestly relies on the value of his matter, more than on any meretricious ornament with which it might be decorated. The branches of the aorta are also described under this head, from the bronchial to the middle sacral. We conclude, however, that the editor proposes to give a connected view of all the arteries in a subsequent part of the work.

Arachnida, by M. Audouin of Paris, is not finished in this number. Who could have thought of it? anus, aorta, arachnida, all in the same sheet. Twenty years ago sensible men and good human anatomists shook with laughter at cat and dog anatomy, but what will they now say when the very spiders are torn from their peaceful dwellings among the undisturbed tomes of Hippocrates and Galen, to establish physiological truths or dispel errors. Formerly the physiologist would say blood is changed from venous to arterial by the agency of air introduced into the cellular organ in which it circulates; another would say, where is your cellular organ in the water-washed branchial lung of the fish, and compel him to amend his generalization by admitting a respiration by a naked organ immersed in water. Here, however, he is not permitted to rest, but is obliged to admit a third modification of the apparatus in the pulmonary branchiæ of spiders, as described in this article by M. Audouin.

Here, however, we must take our leave of Dr. Todd's col-

lection of monographs, wishing him all the success the undertaking deserves, and earnestly entreating those who do not purchase the book for information sake, to do so to encourage an attempt to enlarge and cultivate the minds of the rising generation. An attempt particularly praiseworthy at a moment when the base and profligate are indefatigably busied in endeavours to brutalize and degrade the student by pandering to his worst passions, or in efforts to eradicate those feelings without which the medical man, otherwise a blessing, becomes a curse to society.

Remarks on the Influence of Mental Cultivation and Mental Excitement upon Health. By AMARIAH BRIGHAM, M. D. Boston, U. S.: Marsh, Capen, and Lyon, 1833. Second edition, 12mo. pp. 130.

We take the liberty of extracting the following passages of a review of this book from the Phrenological Journal, because the advocates of phrenology adopt the work as an exemplification of its application to purposes of utility, and claim Dr. Brigham *nolens volens* as an associate. Independent, however, of the effect which the facts or reasonings may have on phrenology, it is obvious that the subject is one of the highest interest, and claims the attention of a Dublin practitioner more particularly. Whether it be from the facility of gratifying ambitious feelings by the attainment of those honours which our University affords, or from the peculiar organization of Irish brains, we cannot tell, but we suspect that the pernicious consequences of precocious mental exercise is more visible here than elsewhere; often indeed to such an extent that we are justified in saying that it amounts to a vulgar folly. The review alluded to proceeds as follows:

“ The inductive motive of the publication of the volume, as the author says in his preface,

“ ‘ Is to awaken public attention to the importance of making some modification in the method of educating children which now prevails in the United States of America. It is intended to show the necessity of giving more attention to the health and growth of the body, and less to the cultivation of the mind, especially in early life, than is now given; to teach that man, at every period of his existence, should be considered both as a spiritual and material being—as influenced both by physical and moral causes—and that therefore all plans for his improvement should be formed, not from a partial view of his

nature, but from a knowledge of his moral, intellectual, and physical powers, and of their development.'

" In section first, he demonstrates that ' the brain is the material organ by which the mental faculties are manifested.' The reader will be at no loss to refer the following words of the author to the right state of his opinions :

" ' That the brain is the material organ of all the mental faculties, scarcely, at this period of science, requires to be proved.'* To ' discipline the mind' means, therefore, to call into regular and repeated action *certain portions* of the brain, and to enable them to manifest easily and powerfully *certain mental operations* : this process is like that of exercising other organs of the body, thus giving them increased facility in the performance of their respective functions. There is much proof that the brain consists of a *congeries of organs*, each of which, in a healthy state, manifests a particular faculty of the mind, and that the power of each faculty chiefly depends on the size of its appropriate organ. I allude to these facts, however, only for the purpose of directing the inquiries of others to them. My present aim is simply to show that the brain, considered as a whole, is the instrument by which the mind operates ; and I hope to impress this fact deeply upon the minds of all those who are engaged in the education of youth.'—pp. 18, 19.

" The author details the usual evidence, drawn from injury to the brain and from insanity ; referring to various writers who adduce an immense preponderance of cases in which, in the insane, the brain has been found more or less organically deranged.

" ' It is curious,' he says, ' to notice that often an injury of the brain impairs only that part of the mental faculties (memory). Such instances give great support to the phrenological views of Gall and Spurzheim, who contend for a plurality of organs of the brain, and a separate and peculiar function to each organ.'—p. 25.

" The general proposition which the author wishes to establish is, that whatever excites the mind, excites and stimulates the brain.

" ' This we know from experience in a severe headache. We perceive the pain to be increased by intense study or thinking, and that mental application determines more blood to the head. So true is it that mental excitement produces an increased flow of blood to the head, that surgeons are very careful to preserve a quiet state of mind in those whose heads are wounded.'—p. 29.

* " Elements of Pathology, by Caleb Hillier Parry."

“ The author concludes the first section with these words :

“ ‘ While people are exceedingly fearful of enfeebling and destroying digestion by exciting and overtasking the stomach, they do not appear to think they may enfeeble or derange the operation of the mind, by exciting the brain by tasking it when it is tender and imperfectly developed, as it is in childhood.’ ”—p. 33.

“ The subject of the second section is, ‘ The condition of the brain in infancy ; the effect on the mind of excitement and enlargement of the brain by disease ;’ and the proposition that ‘ mental precosity is usually a symptom of disease.’ We are inclined to extract here a little more at length from Dr. Brigham’s work.

“ ‘ Since at first no organ is fully developed and prepared for the powerful execution of its appropriate function, let us inquire at what time of life nature has prepared the brain for the performance of the important office of manifesting the mind.

“ ‘ Let us begin with the infant, and ascertain what is the condition of its brain in early life.

“ ‘ The brain of a new-born infant weighs about ten ounces ;* that of an adult, generally, three pounds and a half, apothecaries’ weight, frequently a little less.—But if the mind of an adult has been long devoted to thought, if he has been engaged in constant study, his brain is usually increased beyond this weight. The brain of Byron, for instance, is said to have weighed four pounds and a half ; and that of the illustrious Cuvier, four pounds thirteen ounces and a half. The size of this organ increases from the time of birth till manhood, remains stationary from this period until old age, and then diminishes in bulk and weight.† The relative size of its different portions constantly varies during several of the first years of life, and is not until about the seventh year that all its parts are formed.‡ During childhood it is ‘ very soft, and even almost liquid under the finger, and its different parts cannot be clearly distinguished.’ § Still at this time it is supplied with more blood, in proportion to its size, than at any subsequent period. It then grows most rapidly, and more rapidly than any other organ : its weight is nearly doubled at the end of the first six months ; and hence the nervous system, being connected with the brain, is early developed, and becomes the predominating system in youth.

“ ‘ But this great and early development, though necessary for the above purposes, very much increases the liability to disease : it gives a tendency to convulsions, and to inflammation and dropsy of the brain, and to other diseases of the nervous system which are most common and fatal in childhood.

“ ‘ It is, therefore, deeply important that the natural action of the

“ * Meckel’s Anatomy, vol. ii.”

“ † Andral’s Pathological Anatomy, vol. ii.”

“ § Bichat’s General Anatomy, vol. i.”

“ ‡ Meckel.”

nervous system should not be much increased either by too much exercise of the mind, or by too strong excitement of the feelings, lest at the same time the liability of children to nervous diseases be increased, and such a predominance given to this system as to make it always easily excited, and disposed to sympathize with disorder in any part of the body; thus generating a predisposition to hypochondriasis and numerous afflicting nervous affections.

“ Mental excitement, as has been shewn, increases the flow of blood to the head, and augments the size and power of the brain, just as exercise of the limbs enlarges and strengthens the muscles of the limbs exercised. The wonderful powers of mind which an infant or child sometimes possesses, and by which he surpasses ordinary children, do not arise from better capacity in the mind itself of the child, but, in fact, from the greater enlargement than usual of some portion or the whole of the brain, by which the mind is sooner enabled to manifest its powers. This enlargement takes place whether the mental precocity arises from too early and frequent exercise of the mind, or from disease, and it must arise in one of these two ways. But, in my opinion, mental precocity is generally a symptom of disease; and hence those who exhibit it very frequently die young. This fact ought to be specially remembered by parents, some of whom regard precocity, unless accompanied by *visible* disease, as a most gratifying indication, and, on account of it, task the memory and intellect of the child. Sometimes, however, it is accompanied by visible deformity of the head, and then the fears of parents are greatly awakened. Take, for instance, the disease known by the name of rickets. Every person understands that this is a disease of childhood, and according to the best medical authorities, it arises from the irritation or inflammation of some organ, and frequently of the brain. Its most characteristic symptoms, when it affects the brain, are an enlargement of the head, and premature development of the intellectual faculties. On examining the heads of those who have died of this disease, the brain is found very voluminous, but ordinarily healthy. Meckel observes that its mass is increased in rickets; an effect gradually produced, without disorganization of the brain, by increased action in its blood-vessels, and the consequent transmission to it of more blood than usual. Being thus augmented in size, increased mental power is the consequence of this augmentation. ‘One of the most remarkable phenomena in the second stage of rickets,’ says M. Monfalcon, ‘is the precocious development and the energy of the intellectual faculties. Rickety children have minds active and penetrating; their wit is astonishing; they are susceptible of lively passions, and have perspicacity which does not belong to their age. Their brains enlarge in the same manner as the cranium does.’ He adds, ‘This wonderful imagination, this judgment, this premature mental power which rickets occasion, has but a short duration. The intellectual faculties are soon exhausted by the precocity and energy of this development.’*

“ I do not say or believe that cautious tasking of the minds of young children will frequently cause this disease; but I believe there is great danger that it will produce the same unnatural growth of the brain, and this will give rise to an exhibition of superior mental power, and be followed, as in the case of rickets, by permanent weakness, or loss of mental energy.”—pp. 34—38.

“ Dr. Brigham’s third section is devoted to the ‘Consequences which have resulted from inattention to the connexion between the mind and the body,’ and to the proposition that ‘the best minds are not produced by early mental culture.’ He strongly recommends to teachers of youth to acquaint themselves with human anatomy and physiology, especially of the brain, before they proceed to cultivate and discipline the mind. He objects to the excessive abundance of ‘books for children,’ some of them for children of from two to three years of age; and holds that time is idly spent and mind injured in poring over such books. This, he says, is the result of making prodigies of children. The following is an example of the kind of infant education which the author deprecates:

“ That children *do* have their mental powers prematurely tasked, is a fact which I know from personal observation. I have seen a course like the following pursued in many families in various parts of the country, and I know that this course is approved of by many excellent persons. Children of both sexes are required, or induced, to commit to memory many verses, texts of Scripture, stories, &c., before they are three years of age. They commence attending school, for six hours each day, before the age of four, and often before the age of three; where they are instructed, during three years, in reading, geography, astronomy, history, arithmetic, geometry, chemistry, botany, natural history, &c. &c. They also commit to memory, while at school, many hymns, portions of the Scriptures, catechisms, &c. During the same period they attend every Sunday a Sabbath-school, and there recite long lessons: some are required to attend upon divine service at the church twice each Sunday, and to give some account of the sermon. In addition to these labours, many children have numerous books, journals, or magazines to read, which are designed for youth. I have known some required to give strict attention to the chapter read in the family in the morning, and to give an account of it; and have been astonished and *alarmed* at the wonderful power of memory exhibited on such occasions by children when but five or six years of age. I have known other children, in addition to most of the above performances, induced to learn additional hymns, chapters of Scripture, or to read certain books, by the promise of presents from their parents or friends.”

“ In all that we have written on the subject of infant schools,*

* Vol. vi. p. 418, and vol. vii. p. 108. See also Simpson’s “Necessity of Popular Education,” p. 133.

we have broadly and anxiously stated, that moral training, and that guarded precisely as it is by Dr. Brigham in his fifth section,—so as to exercise the superior moral sentiments, which in general, when left to themselves, act too feebly to be in the smallest danger of over-excitement, and to regulate and moderate the selfish passions and animal propensities,—is the *primary* end of an infant school; and that intellectual training should be a *secondary* and accessory object only. As a secondary object, we have strongly urged that it should never approach to *labour*, that it should never overtask the infants, and that the utmost they attain should be acquired incidentally, almost unconsciously, and in the very manner in which the infant would instruct himself, by the exercise of his senses and observing powers, if left alone; only that his attention should be better directed, and the faculties which Nature, as Doctor Brigham rightly affirms, has, in the stage of infancy, appetized for that knowledge of external objects which infancy is the period to attain, should receive their legitimate food better prepared, and more usefully administered. We have ever been enemies to long lessons, tasks, and laborious repetitions. When teachers of infant schools have forgotten, as they are perhaps apt to do, that the intellectual training is only secondary, have allotted to it the principal place and the larger share of time, and, yielding to the ignorant prejudices of parents, who wish 'learning' for their money, have crammed their infant pupils for the supposed credit of their own teaching, we have held that they were departing from the essential principle of legitimate infant training. Nothing would tend more effectually to bring them back within the proper bounds of that intellectual training which should be harmless, and even beneficial, than just such a work as Dr. Brigham's; and we, therefore, earnestly recommend it to the perusal and reperusal of every infant school teacher. One obvious improvement it would be well if the directors of infant schools would most especially enforce—a *great deal more time ought to be spent in the play-ground, or at least at play, than is now almost anywhere allowed.* The usual alternation is an hour at lessons, and a quarter of an hour in the play-ground. We would have this proportion well nigh reversed; *we should wish to see the infants, at the very least, one-half their school-day in the play-ground.* There can else be no time, no opportunity, for moral exercise in reasonably continued intercourse. The teacher's handbell is rung for a return to lessons before they have had time to commix, and even before they have reaped the benefit of air and muscular exercise; while he himself, engrossed, as he is, with the intellectual department, is led to pay scarcely any attention to the

play-ground intercourse—the true infant school—and the moral discipline which may there be realized.

“ It does not appear that Dr. Brigham has ever seen an infant school on the system of Wilderspin. His objections have all of them reference to common school or nursery tasking and examining. We have not heard that the Wilderspin system has been yet realized in America. In it, Dr. Brigham would at once see a field for the best possible employment, intellectual, moral, and physical, of children from two to six years of age—the best, the only arrangement, when they are judiciously managed, for dispensing precisely that kind and degree of intellectual culture, and that moral and physical exercise, which are most desirable, and which can be realized only in a little community of sufficient numbers, as we have often said, and in no private family whatever. But to proceed blindly to cry down the infant school system, by which alone a practical course of moral education *can* be applied to the great body of the people, from a hasty conclusion that an infant school is a machine for over-tasking, over-working, and over-exciting the minds, and destroying the health, of children, would be a proceeding of gross ignorance, and great and serious mischief. Yet we are glad it has been threatened; we rejoice, too, in Dr. Brigham’s work; for the threat and the work will both tend to put infant school conductors on their guard, lest their schools should lapse into the abuse which has thus been pointed out.

“ We have only to add on this head, that, in the Edinburgh Model Infant School, with which we are best acquainted, although there is more lesson-work and less play-ground exercise than we quite approve, we have not seen or heard of any of the effects of over-doing which Dr. Brigham justly deprecates: the children appear in school uniformly in the most rosy health and high spirits, delighting in all they learn as mere amusement,—quite as insensible of acquisition as if they were picking it up of themselves, and utter strangers to any thing bearing the semblance of mental labour. These statements are grounded on the personal experience of five years. Mr. Wilderspin has enjoyed the experience of nearly twenty, and can fully confirm our conclusions.”

SCIENTIFIC INTELLIGENCE.

Experiments in the Inoculation of Cows, by Doctor Carganico, district-physician in Prussia.—The doubts concerning the protective power of cowpock, awakened by the experience of latter times, have given birth to a multitude of experiments and propositions, more or less new, and more or less to the purpose. The idea of renewing and regenerating the inoculation matter from time to time, and, since an original cowpock is so hard to be met with, of producing this by means of an intentional transference of the common cowpock-lymph to cows, is certainly one of the most deserving of attention, and has, to say the least of it, much plausibility. But as the controversy on this subject is going on briskly, I will no longer defer to state briefly what I have myself observed in cases of the kind, the publication of which I have indeed hitherto delayed only because, for the reasons assigned below, I did not attach any such great importance to the matter.

Every spring since the year 1830 (consequently five consecutive years) have I inoculated a cow, and with the lymph obtained from the cowpock, thus produced, I have vaccinated a part (and that always one and the same part) of this district, (circle.)

There was always chosen for the experiment a two or three year old cow, in her first pregnancy, and of English breed, partly because the herd of Mr. B. (who kindly afforded the means of making the experiment) consisted chiefly of English cattle, and partly because, from the greater frequency with which the disease appears in England, the supposition of a certain peculiar predisposition seemed to be warranted, and consequently the hope of a surer result. For this reason was also that point of time chosen, when the udder of the animal began to fill, because the heightened vitality was supposed to be attended by a peculiar susceptibility for the contagion, and a greater aptitude to the powerful development of the exanthema: besides, after calving, and during the time of milk, a cow is less willingly spared for such experiments, and the act of milking would itself be likely to hinder and disturb the formation of the pustules.

The lymph for the inoculation of the cow was taken immediately from the arm of a child, and the operation itself performed in the usual manner, half with the puncture, half by scarification, so that in each teat were made two, in the whole

eight wounds. The cow was kept in stall, dry straw was scattered under her more abundantly than at other times, and she was visited from time to time. From the distance of my residence I could not indeed make a visit every day, but only a few times during the course of the disease produced. The taking of the lymph from the cow was always on the eighth day, and there were then in the course of the different years respectively from two to ten children inoculated with the usual six punctures. From these again was lymph taken on the eighth day, and so forth; so that every time a certain section of the circle, containing from 310 to 350 *inoculati*, and that, each time, in seven or eight derivations, was thoroughly vaccinated. The same part of the circle was always again provided with inoculation out of this source, in the idea that if a stronger protection should indeed arise out of these measures, this must, on longer continuance of the experiment, and on re-appearance of pock-peril, be capable of ocular and geographical demonstration, in that this whole district would remain chiefly (or for the most part) free.

As matters of fact, which have chiefly come out in the course of this experiment, (which will be allowed to be of some compass and significance,) I have now to adduce what follows.

1. The result of the experiment in the inoculated cow was always very easily and surely to be arrived at. For not only was the operation itself very easy, since the animals were generally quiet under it, but there remained hardly ever even one or two punctures without effect—on the contrary, there arose in general, from the eight wounds, eight regular pustules of sufficient size. All these pustules were on the eighth day raised in the usual manner above the level of the skin, had in the centre a navel-like depression, a colour inclining more to bluish-grey than in human subjects, verging on opal,—a faintly reddened, but more observably hard and swollen *halo* than in inoculated children,—and contained a clear lymph, which appeared perfectly like that taken from human vaccine-pustules. The pustules obtained through a mere puncture were round; those arising from an incision had always a longish, bean-like form, corresponding to the length of the little wound. Not always, yet once or twice, the cow was on the eighth or ninth day restless, without appetite, and somewhat feverish. The scabs were always brown, and remained about as long as they commonly do on the arms of inoculated children. In the course of these five experiments, no exanthema has arisen elsewhere than on the wounded parts. On the other hand I am informed, that on one occasion the very interesting case occurred, that after a few weeks several other cows of the same herd had, according to the description given to me, a perfectly similar eruption on the udder, but unfortunately I learned this much too late, to be able to satisfy myself, by actual inspection, of the nature of this eruption, and to raise to a higher degree of certainty the conjecture that it was a real cowpock, which had arisen from infection of the inoculated parts, and in a certain degree spontaneously.

The taking of the lymph from the cows was always less easy, as the animals shewed themselves more sensitive and uneasy under that operation. However, with some foresight and dexterity, this little operation had no real difficulty.

2. As to the result of their further inoculation, it always succeeded; yet it cannot be affirmed that the cowpock thus produced was to be outwardly distinguished, in any respect whatever, from that obtained in the usual way. The comparison could be made in sufficient extent, since besides the 310 or 360 persons who were inoculated with the lymph got from the cow, there were always at the same time about double that number of children inoculated with common lymph, in other parts of the circle. But in the two classes the course, size, shape, formation, and even the little modifications and varieties of the vaccine exanthema, presented not the slightest difference. I should not be saying truth were I to affirm that the lymph which went through the cow produced, as far as I saw, larger or more perfect pustules, with more significant peripheric redness, or stronger fever. Indeed the circumstance has occurred to me, that of the inoculations made *immediately* from the cow, comparatively many miscarried almost every year. But I have not without reason held that for a mere accident, and ascribed it to the above mentioned difficulty of the operation of taking the lymph from the animal, in which there was often a failure of sufficiently imbuing the lancet, so that many of the punctures made with it remained without result. In the farther inoculation, from child to child, all the usual certainty of the result was to be seen, and about the same proportion of exquisite, perfect examples, together with the customary little variations. On the whole, if indeed the effect of a lymph thus renovated be other and more powerful than that of the ordinary human lymph, this does not at least indicate itself by any outward appearance.

The main point is, and remains indeed ever, the demonstrative protective power. As to what concerns this, I must again, conformably to the truth of fact, report.

3. That the aforesaid experiments upon this protective power, and the peculiar measure thereof, have as yet been able to yield no result. That is to say, the object of laying down, as it were geographically, in view, in a whole district, the presumed greater protective power of this lymph, is not yet obtained; but on the other hand, just as little is there a ground to give up this presumption at once. When, after a pause of three years, small pox again during this spring shewed itself in our circle, it was just the very parish which had been some years before inoculated with the generation of lymph, immediately derived from the cow, that had the earliest and most numerous cases, (thirteen or fourteen.) On close investigation and inquiry it turned out, however, that not one of these cases befell a person inoculated in the manner related. Indeed this is equally true of all the other inoculated persons of the last six years, out of the whole circle, of whom hitherto not one has been found among the patients affected with small pox. That

circumstance therefore says nothing either *pro* or *con*. Also in every case in order to bring the results of the experiment to the desired evidence, it must be carried on yet many years, generally speaking so long as until the whole mass of the youth of the respective circle be inoculated through it with that lymph ; and to this my view is directed.

The precursive results obtained by means of the communicated experiment may then be briefly summed up in this,—that the lymph, renovated by transference to cows, has, in the outward appearance of the cowpock, presented no alteration ; that also a comparative estimate of its protective power has not yet been possible, but considering the facility and simplicity of the experiment, the continuation and repetition of it is by all means to be wished and to be recommended.

This agrees also, as far as I know, with the experience of others on the subject under consideration. It is not to be denied that hitherto the grounds on which the necessity and usefulness of the regeneration of our cowpock lymph has been defended, have been for the most part only theoretical.—*Berlin Mediz. Zeitung*.

Scarlatina treated by the Application of Ice.—In a work by Dr. Rinna de Sarenbach, entitled *Klinisches Jahrbach des lanfenden Jahrzehnts, &c.* and printed at Vienna, 1835, we find the following original treatment of scarlatina.

A young girl, aged 7, of Mariazell in Styria, had been affected with scarlatina, but the eruption had disappeared very rapidly : the fever still existing, the physician in attendance gave sudorifics without succeeding in bringing back the eruption on the skin ; the strength was declining rapidly ; the pulse scarcely to be felt ; the cheeks became deadly pale, convulsive motions, accompanied with complete insensibility, were the omens of the fatal prognostic. The parents had the dead bell rung, and a candle placed in the hands of the expiring child, after the custom of the country. At this moment Dr. Rinna was called in, and found the following symptoms : the skin hot and dry, the pulse filiform, hard, but equal, and not intermitting ; the pupil without contractility ; the look fixed ; respiration abdominal and slow ; the belly meteorized ; the urine flowing involuntarily, and the feet cold. The patient was all but lost. The physician, as a desperate resort, thought of employing cold. The abdomen was covered two inches thick with snow, which was repeated the moment it began to melt, and continued until the almost inarticulate sounds of the patient gave notice of the pain caused by it ; the snow was then removed, and tincture of wormwood administered. Three hours after the patient was covered with sweat ; the pulse rose ; the belly became sunk, the eyes brilliant, and the patient answered the questions that were addressed to her. Convalescence began a few days after, and an abundant desquamation confirmed the suspicions of scarlatina that had been driven back. At the end of a month the cure was complete.—*Rev. Medicale*, July, 1835.

The Itch Mite.—Many suppose that there is no foundation for the notion that itch is produced by the presence of a parasitical insect, yet there is nothing extraordinary in such an occurrence. Animals without number derive their existence from other animals only, nestling on their surfaces, burrowing in their flesh, or hatching in their skins. Man is preyed upon by the flea, the bug, two species of louse, intestinal worms, hydatids, guinea worms, and others. Even the very insects have their parasites, as any one may see on the dung beetle; and Butler's joke, that "fleas have other fleas that bite them, these others still *ad infinitum*," is not so extravagant as might be supposed. The existence of the itch mite has been established on the authority of Cestoni, Bonomio, Redi, De Geer and others. M. Dugès has obtained the insect in so perfect a state that he has been enabled to represent it in a plate which is copied into the present number of this Journal. It appears to the naked eye as a white point, but its beak or sucker and limbs are red; it, burrows beneath the cuticle, forming tortuous canals, in which the animal is to be sought, not in the pustule. M. Dugès suggests the application of turpentine as a cure with good reason. The insect belongs to the family acarus, being a species of the genus *sarcopeltis*, *sarcopeltis scabiei humani*.—From a *Notice* by M. Dugès in the *Annales des Sciences Naturelles*, April, 1835.

On the Preservation of Medicines, by M. Menigaut.—This communication contains many suggestions worthy of the attention of apothecaries, and especially of those in country places, where the demand for medicine is very limited, and where consequently drugs must be kept for a length of time. M. Menigaut premises his observations by warning his readers that heat, light, air, and moisture, are the agents to be dreaded in the shop and laboratory. Moisture especially, leading, as it does, to moulding and breeding of insects, is to be guarded against. To obviate this evil he insists upon the necessity of the most perfect drying of roots, woods, leaves, and flowers, in stoves or otherwise, and their subsequent enclosure in glass vessels carefully cleaned and dried, keeping small quantities in separate bottles for daily use to obviate the necessity of opening the sealed bottles; looking over the stock repeatedly, especially in spring and summer, and returning any exhibiting appearances of mould to the stove. Contrary to the authority of MM. Henry and Guibourt he directs that almonds and other seeds should be perfectly dried, and states, that in 1826 he exposed about 20lbs. of sweet almonds to a moderate heat for ten days, and when perfectly dry and brittle enclosed them in six bottles, which he buried, and found the last, which he opened in 1834, in perfectly good condition. Powdered squill, said to be difficult to keep, he recommends to be preserved in several perfectly filled bottles instead of being frequently exposed to the air, as when all is preserved in one bottle for daily use. Oils he recommends to be bottled without a particle of air beneath the cork. Syrups suffer from fermentation only, the mouldiness which they sometimes exhibit not

being injurious, and being a positive proof that fermentation is not going on. Laudanum should also be preserved in separate well filled bottles successively opened for daily use, otherwise a considerable deposit takes place. The distilled waters have their virtues greatly impaired and finally destroyed by exposure in bottles frequently opened. If this brief notice have no other effect, it may prove valuable by shewing the attention paid to this subject by our neighbours, and reminding others of the necessity of following their example.—*Journal de Pharmacie*, Aout, 1835.

Influence of Professions and other Circumstances on Longevity.—Two communications are before us on this subject, one in the Memoirs of the American Academy of Arts and Sciences, by Mr. Worcester, the other in the *Annales d'Hysière Publique*, by Dr. Lombard. The nature of this Journal does not admit of a detailed investigation respecting this subject, but a brief allusion to the results may prove interesting to some of our readers. A number of examples are adduced by Mr. Worcester, of persons attaining the age of 100 years or more, a great number, however, perhaps a majority, unauthenticated, as usually happens in such enumerations, which indeed is admitted by the author. He states it to be a prevalent opinion that the first settlers in America lived to greater ages than the present generation; this he considers probable, but says that documents do not verify it. It appears that in Sweden, which is a healthy country, one person only in about 27,000 was found to have attained the age of 100; in England, one in 58,000; in Wales, one in 33,000; while in Scotland and Ireland one in 19,000 have attained that sightless, toothless, and senseless celebrity. These results differ materially from those stated by Malte Brun, and the data are at present so insufficient that no satisfactory conclusions can be derived from them. It may be some consolation to those "who leave their country for their country's good" to learn, that change of climate conduces to longevity in other ways than placing them out of the reach of the obdurate John Ketch. Mr. Worcester says, "It has been asserted that the principle of life is deteriorated in America, and that a British constitution will last longer, even in that climate, than a native one. It is doubtless true, that a large proportion of those who have attained to an extreme old age in this country, have been of foreign birth. Change of climate is esteemed favourable to long life; and many Englishmen as well as other Europeans, by coming to America, have undoubtedly lived to a greater age than they would have done had they remained in their native land." The following observation may serve as a lesson to the proud tenant for life of superfluous income: "Among centenarians are found few persons of rank or fortune; few professional men, or men of science and literature. Monarchs have not often exceeded the age of 70; and of about 300 popes, only seven are said to have reached the age of eighty. By far the greater part of those, whose lives have been extended

to a period beyond 100 years, have been persons of humble rank in society; such as enjoyed few of the luxuries or accommodations of life, but were accustomed to hard labour and coarse fare, such are the persons who, *if temperate*, are more likely to enjoy health and long life, two of the things most coveted by man, than those who are possessed of affluence, and occupy more enviable stations." But let the humble possessor of a moderate competency recollect, that these advantages are reserved for him with the qualification "*if he be temperate.*" We every day, it is to be admitted, meet old, very old drunkards, but they are only forty or fifty years of age.

Dr. Lombard's paper has reference to the influence of professions and trades on longevity, and from it we learn that the prolongation of life to seventy, or its cessation at forty-five, on an average, is in a great degree determined by the pursuits and habits of individuals. Taking fifty-five as a medium period, it appears that the members of the following professions and trades exceed that number,—lawyers, physicians, apothecaries, magistrates, clergy, schoolmasters, stocking-weavers, cheese-mongers, architects, notaries, carpenters, breeches-makers, chandlers, courtiers, grocers, and many others; while surgeons, literary men, cooks, tailors, scriveners, shoemakers, and a host of others fall short of it.

It is remarkable, that the average period of life of a physician, is one of the highest among the professions, and that of an undertaker's assistant the highest of all. From the same sources, which are of course insulated, and not strictly appreciable to other places, it appears that more suicides were committed by persons in narrow or limited circumstances, than by those in affluence. It also appears that, every thing considered, easy circumstances, with active habits, contribute to longevity, while sedentary habits, with limited means, and want of ease, mental and bodily, have an opposite effect.

Bougies with Screw-points.—It appears that M. Leroy d'Etioles has been calling the attention of the French Academy to a contrivance of this description; a common elastic bougie, with a few threads of screw at the extremity. The application of such an instrument is so obvious, that it has probably been already tried, and it may perhaps be made available in particular cases and in proper hands, but in other cases, and in rash or clumsy hands, may do much mischief. The method of construction does not appear, but a silver wire, terminating in a thick point, having a screw formed on its surface, and the rest of the wire covered with the usual bougie tube of gum-elastic its entire length, would answer the purpose.

Epilepsy cured by Nitrate of Silver.—Suaveur Puleo of Palermo, a carter, aged twenty-nine, of a sanguine temperament and athletic constitution, and enjoying perfect health, was seized suddenly and without any known cause, in 1822, with a fit of epilepsy, which left

him for several days in a state of stupefaction. Hardly was he recovered from the first attack, than he had a second fit much longer and more intense than the first. He then consulted a physician, who put him through all the forms of treatment usually prescribed in such cases: far from getting better, the fits came on more frequently, and were of longer duration, so that he was obliged to give up his occupation from the serious accidents to which it exposed him. Still the fits became more frequent and continued for a longer time.

In June, 1834, Professor Placido Portal advised the patient, as a last resource, the internal use of nitrate of silver. The dose was in the form of a pill, composed of one-sixteenth of a grain of the nitrate of silver, with six grains of extract of camomile, washing it down with a cupful of decoction of sage. This dose was continued for two days, after which the dose was increased gradually to a grain in the twenty-four hours. A very marked improvement was evident through the months of June, July, and August, and the fits became so far less frequent, that the patient was enabled to resume his former occupation. During this period the fits reappeared but twice, and were very short, and by no means intense.

In the month of September, seeing that the patient was almost cured, Dr. Portal thought it advisable to put him on the following formula: one grain and a half of nitrate of silver, with six grains of nux vomica, in three pills; under this treatment the patient was perfectly cured in the following month.

Obs. 2.—The following case is related by Dr. Semenza. Vincent Jennaro, set. twenty, in easy circumstances, of a sanguine temperament and athletic constitution, having a well developed head, was attacked in 1829 with epileptic fits, after a sudden arrest of epistaxis. The most energetical means were employed without success. In August, 1831, Dr. Semenza having called to see the patient, ascertained that the fits were more frequent when the patient was plethoric; there were evident marks of congestion of the head, and a livid tint was to be observed round the lips and eyelids; his appetite was irregular and morbid. The fits were epileptic in all their characters, returned every twenty days, and amounted to six or even nine attacks in the hour; and were always preceded by an aura epileptica, beginning at the extremity of the right thumb, and extending like a flame towards the brain, with increased intensity, and momentarily suspending the organic functions. The patient was first put on the use of magnesia usta, as a light purgative, on a strict regimen, chiefly vegetable, and was prescribed abstinence from all stimulating drinks. Eight days after this treatment, his physician decided on the treatment by nitrate of silver. The conditions were favourable for the employment of this remedy, for the sensibility of the patient was generally obtuse, and all the organic functions performed remarkably slowly. The first day he got a quarter of a grain of nitrate of silver, made into a pill, with powdered camomile, and common syrup. He

took one pill every day for ten days, without any apparent effect, having been produced. On the 11th he was bled copiously; leeches were applied to the anus, and one-third of a grain of the nitrate administered. On the twenty-first day the dose was increased to half a grain, and afterwards to a grain per day. The highest dose given was one grain and a half per day, and continued for a month: the fits did not appear during this period. Three years have passed since the patient has suspended all treatment. He follows his occupation with activity, and has had no convulsions nor nervous symptom whatever. The cure was perfect.—(*Filatire Sebez o*, April, 1835.)—*Archives Generales*, April, 1835.

Ununited Fractures cured by Means of a Seton, by Dr. Portal, Surgeon in Chief to the Grand Hospital of Palermo.—In September, 1834, Joseph Ragusa, a stout peasant, æt. 24, was admitted into the Hospital of Palermo. In July preceding he had received a gunshot wound in the left arm, which caused a comminuted fracture of the humerus at its middle third; a few splinters had been extracted by a surgeon on the instant. It was two months from the occurrence of the accident that he presented himself at the hospital with the ununited fracture, which was the seat of very sharp pains on the least motion. Matters being in this state Dr. Portal, previous to amputation, wished to try the effect of a seton introduced between the two ends of the fractured bone. During the first three days the seton caused pain and inflammation, which were treated topically by emollients, and internally by the potus tartari. On drawing the seton on the fourth day a great quantity of pus escaped from the wound, but its issue diminished gradually: the rubbing caused by the seton between the two fragments gave issue to a splinter of bone. From this moment the pains diminished greatly: the seton was allowed to remain in for twenty-four days, during which time the pus became improved both in quantity and quality. The seton was then withdrawn, and the wound dressed with styrax ointment; a circular bandage and graduated compress was the means of keeping up a light pressure during the month of October and part of November, after which the patient left the hospital perfectly cured.

There is another observation in the case of a child aged two years: he had fractured the right thigh in its upper third; after every other means had failed of causing union of the fracture the seton was introduced, and several fragments of bone came away that had remained for three months. There was some shortening of the limb, but the thigh acquired such solidity that the patient left the hospital, perfectly cured, in the following February.—(*Il Filatire Sebezio*, May, 1836.)—*Archives Generales*, July, 1836.

On the chemical Composition of Broths.—The erroneous notions entertained by many respecting the administration

of soups and broths as articles of nourishment to invalids, may derive some corrections from such investigations as the following. Five hundred grains of meat, deprived of bone, fat, and tendon, were put into a litre and half of distilled water, and gradually brought to the boiling point, and continued so for five hours, renewing the water as it evaporated. The decoction had the odour of soup, an agreeable taste and yellowish colour, contained twelve parts in 1,000 of animal matters, and three parts in 1000 of inorganic : spring water, containing sulphate and carbonate of lime, afforded a broth of less odour and inferior taste. When the meat was put into boiling water at once, the proportion of animal matter in solution was less, and the broth inferior to that obtained by heating gradually. The difference in flavour of broths appears to depend more upon the nature and proportions of the saline than the animal ingredients. In boiling meat in the usual manner the albumen is partly dissolved before the temperature is raised to the degree at which it coagulates, when the remaining portion is partly coagulated, rises in scum, and partly dissolved in the water ; the cellular membrane is partly dissolved, but some of it remains in a more or less indurated condition. The fibrine of the muscle is hardened, but none of it is dissolved, and if it was not for the cellular membrane, albumen, and oil between the fibres, would prove a refractory article of diet. The fat remains partly entangled in the meat and partly floats at top ; the flavour of broths arises from it in a considerable degree : much change is effected by evaporation, decomposition, and new combinations during protracted boiling, the volatile parts upon which the flavour principally depends being dissipated. These experiments were instituted to determine the nature of the peculiarities of broths obtained from the dried extracts of meat called portable soups, and from the results, as well as from common experience, it may be inferred, that the most palatable and suitable broths or soups for convalescents requiring great care as to delicacy of diet may be obtained by soaking the meat for some time at a low temperature, and setting aside the solution, to which should subsequently be added the stronger broth obtained by adding fresh water to the meat and continuing the boiling ; or palatable broths may be made with little delay by macerating the meat for a short time in warm water, and adding jelly, previously prepared, in such quantity as may be advisable.—*From a Report of M. Chevreul to the Royal Academy of Sciences, noticed in the Journal de Pharmacie, No. V. Année 21.*

Purulent Discharge from the Ear, terminating in Caries and Death, by M. E. Degranges, D. M. P.—Monsieur R— had been affected in his childhood with inflammation of the left ear, which terminated in purulent otorrhœa, followed by deafness. For a great number of years the only inconvenience felt by the patient was a sanguous discharge from the ear, and deep-seated pains in the temple of the same side, which went away, and returned from

time to time. These pains in the temporal region were always more violent when the discharge from the ear was arrested, and *vice versa*. Sometimes these symptoms were alleviated, on the occurrence of a vomiting of muco-purulent matter. He had been in the habit of removing every morning from the ear the pus that had accumulated during the night; he then used to smoke, and to rinse his mouth for the purpose of getting rid of an insipid, nauseating taste that he felt in the throat: after going through this daily process, he gave no more attention to this enemy that, as it were, lived on him. Instead of submitting to proper regimen, he continued to addict himself to excesses capable of destroying the best constitution. He ate only the most exciting meats and strongly spiced ragouts, salted and pickled fish, &c. &c.; he drank besides a large allowance of wine, a good many glasses of brandy, and other alcoholic liqueurs, during the day. In addition to these good things, he had several times undergone strong mercurial treatment, owing to his venereal propensities.

In the August of his forty-fifth year, Mr. R. was attacked with violent febrile symptoms; at first they were of a remittent character, with tendency to drowsiness in the remission; very soon all the symptoms of acute arachnitis became manifest, and Mr. R. died on the forty-ninth day after his illness. On examination after death, the pia mater was found red and gorged with blood; the arachnoid injected and thickened in the point corresponding to the superior anterior portion of the right lobe of the brain, the petrous portion of the left temporal bone was deeply carious, with separation of the dura mater, but without any communication of its cavity with that of the cranium.—(*Journal de Medicine Pratique de Bourdeaux.*)

—*Rev. Medicale*, July, 1835.

White Blood, by M. Lecanu.—A man, after a violent fit of coughing, was attacked by vomiting of blood, followed by a sense of suffocation, for which he was bled. The blood drawn had the appearance of milk to which a little blood had been added, and some of the blood vomited, as well as that drawn by leeches, was also milky; after resting, this blood deposited a trace of the coloring matter, with little if any fibrine. The remaining fluid resembled milk, or a very strong emulsion; it was alkaline, and destitute of any remarkable taste or smell. The albumen was in the same proportion as in the natural blood: the fibrine and colouring matter had nearly altogether disappeared. The globules were replaced by a corresponding quantity of fatty or oily matters, among which was a matter soluble in alcohol and ether, and communicating acid properties to them; the acid soap of Berzelius, with cholesterine, oleine, margarine, and stearine, were absent or present in a form not to be detected. M. Lecanu attributes the whiteness to the presence of these oily matters held in suspension by albumen, forming an emulsion. The occurrence of this white blood is not a novelty, it has been repeatedly observed, but this frequency of its appearance makes the matter more

interesting, especially when an opportunity has been afforded to a competent person to investigate the subject.—*Journal de Chémie Medicale*, Juin, 1835.

Morbid Appearances in Persons dead of the Plague, by M. Rigaud, Physician to the European Hospital at Alexandria.—When death has occurred rapidly there is observed on the head, neck, upper extremity, breast, and epigastric region, large irregular patches of a colour varying from blue to violet or black, as if they had been stained by mulberries. This colouring, which is often times wanting if the death has been slow, is accompanied with petechiae, varying from the size of a flea-bite to that of a pea, with one or several buboes in the inguinal, axillary, and parotid regions, and very often below these regions: along with those several anthraces are to be met with on different parts of the body, but particularly on the limbs, neck, and breast. The cadaveric stiffness is very evident, the muscles prominent, and the fingers seldom closed.

In the head.—The membranes of the brain are very much injected, and shaded with patches of black blood; the sub-arachnoid vessels of a well defined arborescent appearance. The arachnoid is seldom thickened, but almost always adherent by a whitish leathery transudation, granular at the upper and internal surface of the hemispheres, so as to bring away portions of the cerebral substance when it is being detached. In some rare cases, bloody effusions are found under this membrane, at the summit of the brain, in the trajet of the falk. In other and frequent cases, the sub-arachnoid cellular tissue is infiltrated with serum, of a yellow or a rose colour, at times purulent.

On cutting into the substance of the brain, it is found thickly set with minute drops of blood; the colour of the grey substance is of a deeper shade; the ventricles always contain a little limpid serous effusion; the choroid plexuses are of a red violet colour, and the cerebral substance is seldom softened. The same injection is to be found in the membranes of the spinal marrow; the cephalo-spinal liquid very abundant; spinal marrow but slightly injected, of much more consistence than the brain.

Chest.—The lungs are mostly found in the normal condition, and the accidental appearances to be found in them may always be referred to former lesions. Their vessels are engorged with thick black blood. In one single case,* the incision gave exit to some drops of pus. The pleura was always of a lively red, and presented very frequently old adhesions, and occasionally adhesions of a yellowish serum.

Heart.—The pericardium always contained from half a pound to a pound of serum. The volume of the heart appeared to be augmented; its external vessels perfectly delineated to their most

* He does not say out of how many.

minute ramifications: its surface was sometimes studded with red spots, particularly that of the left cavities, or with little round spots, red or violet-coloured, perfectly similar to the petechiae of the skin. The same transudation was observed on the lining membrane of the pericardium.

The right cavities, particularly the auricles, were distended with black or viscous blood with very often firm gelatinous clots. The left cavities empty, with exception of the ventricle, which contained a little black blood. The tissue of the heart and its lining membrane were in the normal state. The arteries were almost all empty, the veins distended with black blood or gelatinous clots, particularly the jugulars; the lining membranes of the arteries healthy, that lining the veins presenting irregular, roundish patches, as if blotted by ink. The pharynx and oesophagus mostly of a red or violet tint; sometimes the oesophagus, healthy as far as the cardiac orifice, presented a sudden and marked transition in colour, indicating an intense phlogosis.

Abdomen.—The peritoneum rose-coloured, or of a lively red; beneath it were seen a great number of perpendicular vessels engorged with black blood, the largest of the size of a straw, and becoming infinitely ramified in the subjacent adipose tissue, to which they imparted their colour. This adipose tissue was sometimes like a dark coloured pulp, at other times completely piriform. The intestines generally rose-coloured, externally varied in shade, according to the extent of phlogosis, but the vessels were always very arborescent.

The stomach was generally distended with gas, and commonly contained a green or blackish viscous fluid, like a mixture of corrupted blood, and bile. The lining membrane of this organ was of various colour, from rose-colour to a lively red, and from those to a reddish brown, a violet, a leaden, or green bronze colour; this was general in a great number of cases. There were observed also large red or brown patches, ecchymoses, petechial spots, or obscure red points, like miliary eruption, besides ulcerations and softening of the mucous membrane. There were similar lesions in the intestines, except the colon, which appeared less phlogosed, and often narrowed. The mesenteric ganglions were engorged and black.

The liver was almost always increased in size, particularly the right lobe, its vessels engorged with blood, its parenchyma in other respects healthy: the gall-bladder of twice or three times its usual capacity, and full of a great quantity of thick greenish black bile; its cellular tissue infiltrated with black blood; round livid petechial spots were observed under its peritoneal coat. The pancreas healthy, the kidneys engorged with blood, the ureters presented bright red arborizations, or else black spots, as if made with charcoal or ink; their mucous membrane generally thickened, but mostly healthy. The bladder rarely distended by urine, almost always half contracted; its mucous membrane occasionally

mottled like the intestines. The spleen is large, soft, friable, and pulpy.

There was no appreciable alteration in the solar plexus or semilunar ganglions. The thoracic and cervical ganglions, particularly the former, often much developed and injected, both in their neurilema and in their substance; the latter had become firm and even hard, red, and violet-coloured, and exuded blood from many points. These disorders were mostly remarked on the points of the nerves in contact with the lymphatic ganglions. The cellular tissue was everywhere impregnated with red blood, the muscles of a lively red, allowing abundant exudations of blood.

These observations have been made on the autopsies of persons belonging to the most miserable class of society, and addicted to all the excesses of intemperance and debauchery. They were all Europeans, and several medical men attended at the post mortem examinations.—*Rev. Medicale*, July, 1835.

Preservation of Bodies for Dissection.—At a meeting of the Royal Academy of Medicine in Paris, M. Gannal recommends a solution of nitre, alum, and common salt for this purpose, and states, that two bodies immersed in the solution for two months had undergone no change on the surface; the tissues were well preserved and fit for dissection, the body remained unchanged afterward for a fortnight. There can, however, be little doubt that this statement is an exaggerated one, indeed the proposer of the plan proves it to be so when he says, subsequently, the tissues immediately in contact with the fluid lose their colour, and the flesh its cohesion; a very satisfactory condition of parts for dissection and demonstration. The solutions of alum, common salt, and nitre, have been long employed separately and mixed for this purpose, by Dr. Macartney and Dr. Jacob in this city, and by Mr. Brookes in London, but with partial success only. Dr. Macartney has preserved some things very perfectly in solutions of alum and nitre. Dr. Conquest had a museum in London, many of the preparations in which were preserved in solution of common salt, and Dr. Jacob can shew intestines of a whale preserved in a saturated solution of alum, in an open vessel, for nearly twenty years. The fact is, that these solutions preserve some parts and not others, tendinous and membranous parts easily, and muscular parts with difficulty.

Medical Bibliography.—It appears that efforts are making in Paris to cause the re-establishment of a chair of medical bibliography, very judiciously consigned to the moths, and worms, after the death of the last occupant. Students must have much time to spare when they sit down to hear a man read a catalogue, and make criticisms on authors, either living or dead. There can be no doubt that it would afford an additional opportunity for the delivery of fulsome panegyric or malicious detraction. Why should students be collected to hear that read to them which they can

lead themselves, unless the lecturer has something to demonstrate in illustration, or confidential communication to make, the results of daily practice. If a peep was had behind the curtain, there can be little doubt that the candidates likely to come to the *concours* for the new chair, might be seen forwarding the accomplishment of this most desirable measure.

Contagious Diseases in Ireland.—We observe that the act of 1832 for amending the previous act for the prevention of contagious diseases, and which gave increased power and funds to boards and officers of health, has been allowed to expire this session. It extended the former acts to contagious as well as epidemic diseases, and to apprehended as well as existing diseases. It gave officers of health powers to grant supplies of medicines, nourishment, and clothes to the poor, and to the Lord Lieutenant power to advance the requisite funds, and also to enforce the appointment of officers of health. The acts of 1818 and 1819, however, remain still in force, and afford important means of relief should the country be again visited by cholera, or typhus fever become unusually epidemic.

The Lancet and the Medical Institutions of Ireland.—Although we are determined to adhere to the rule which we adopted at the commencement of this Journal, not to enter the field of medical controversy, we consider ourselves imperatively called upon to state, for the information of those unacquainted with Dublin, that the articles which appear from time to time in the *Lancet* respecting the profession and its institutions there, contain such gross and impudent falsehoods, that no confidence should be reposed in them. We do not state this to avert these calumnies; they have been, strange as it may appear to simple people, of singular advantage to the objects of them, but constructed as some of them have latterly been to impose on experienced students at the approach of the medical session, we consider ourselves called on to interpose. If half the time spent in these disgraceful practices was devoted to the acquisition of information, or the honorable practice of the profession, it might place the parties concerned in a very different position from that which they now occupy.

Homœopathia.—“What is the use of throwing water on a drowned rat?” is an old saw, that might be applied to those who are still giving additional proofs of the absurdity of the homœopathic doctrine. The apostles of this medical creed, like Paracelsus of old, send every one to Hades who is so benighted as not to appreciate their wonderfully short cut at curing all diseases. They term themselves Homœopaths, and call the disciples of the Hippocratic school Allopaths, meaning a distinction about as wide as between orthodoxy and heterodoxy. This parasitic plant of theirs

began to shew itself at a time that clouds of theories had obscured the medical atmosphere in Germany, and now it has been fostered with such care by its idolators, that all they want is a golden pruning hook to distribute the blessing to the human race.

Fortunately for mankind about the time that Hahnemann began to blow his mephitic bubbles from the already decomposed rubbish of the Hippocratic system, pathologists in Great Britain and France were sedulously, and with profit to science, pursuing their pains-taking career, bringing into action the good parts of the old school of medicine, and industriously elevating the present edifice with the best materials that the union of thousands of good anatomists could bring together, until they saw it stand the citadel of medical science, and the admiration of every well-instructed mind; when lo! old Hahnemann comes forth like the Veiled Prophet promising

Hours to boys omniscience to sages,
And wings and glories for all times and ages.

The new system got every fair play from the Grand Duke Michael of Russia, about two years ago, but was unable to make good any of its high sounding promises. Well, England was next attempted, but though the English are credulous in quack matters, they could not be persuaded that a medical millenium was at hand. Off they go to France, form an array of homeopath doctors, and demand from the minister of instruction leave to establish a dispensary and an hospital to cure the sick gratuitously, according to homeopathy. The minister thinking fit to consult the Royal Academy of Medicine on the subject, addressed the following letter to the President of the Academy last January;—we extract it from the *Journal de Pharmacie*.

“MONSIEUR PRESIDENT,

“I have received a letter from a homeopathic society lately formed at Paris, soliciting the authority of government to establish them as a legal body. Their project is to form a dispensary forthwith for the treatment of patients on the homeopathic system gratis, and to found a clinical hospital of instruction, when they shall have sufficient funds.

“As such a proceeding involves the question of public health, I have thought fit not to authorize the foundation of such dispensary and hospital before consulting the Royal Academy of Medicine on the advantages or disadvantages such a proceeding would be likely to cause to the public. I pray you then, M. le President, to submit this letter to the Royal Academy of Medicine, and to demand of it, in my name, if it would be suitable (the public being interested) to allow the establishment of such an hospital and dispensary. This is not merely a matter of scientific opinion but rather a question of medical police, which should excite all the solicitude of government.

"Accept, M. President, the assurance of my most marked consideration,

"The Minister of Public Instruction,

(Signed.)

"GUIZOT."

The above letter having been communicated to the Academy at the sitting of the 27th January, the following committee was appointed to prepare an answer to the letter: MM. Husson, Renauldin, Gueneau, De Mussy, Delens, Lerminier, Boullay, Lissfranc, Andral, and Andral, junior. The report of this committee was unanimously adopted by the Academy (we say unanimously, as there were but *two* dissentient voices) in the sitting of the 24th March, and the following answer sent to the Minister of Public Instruction.

"MONSIEUR LE MINISTRE,

"Homœopathy, which presents itself to you with all the delusions of novelty, is by no means a novelty in art or science. It is a system which has been erratic for twenty-five years, first in Germany, next in Prussia, afterwards in Italy, and now seeks to be introduced into France; but everywhere it has struggled in vain to be admitted within the pale of scientific medicine. Often, and for long periods, have the Academy undertaken the test of its worth, nay, some of the members of the Academy have dipped deeply in the inquiry of its basis, progress, practice, and effects.

"Amongst us, as elsewhere, homœopathy has been submitted to rigorous logical tests, and from the onset logic has pointed out in the system such a crowd of formal opposition to the best established facts, such a number of most striking contradictions, so many absurdities palpable to the eyes of enlightened men, that the system is merely calculated to act on the credulity of the multitude, who do not think.

"We have submitted homœopathy to the proof of investigation in facts; it has gone through the crucible of experiment, and observation has furnished us as well as others with most categorical and most severe replies to our inquiries. For though some certain cures performed, as they say, by homœopathy may be blazoned forth, we know that the biased affection of a prejudiced imagination on the one hand, and on the other the healing powers of nature, call into question their title to success. On the other side, observation has given evidence of the mortal dangers of such proceedings in those frequent and severe cases that our art is called on to treat, where the physician may do as much evil by not acting at all, as by doing too much.

Reason and experience are then both combined in expelling forcibly from the understanding such a system, and in leaving it to rise or fall by its own merits. It is for the interest of truth,

and for the advantage of systems, particularly of systems of medicine, that they should not be either attacked, defended, persecuted, or protected by power. Sound logic is their surest verdict; their natural judges are facts; their infallible touchstone is experience. To abandon them to the free action of time should be their award: time is the only arbiter in these matters; it alone does fitting justice to vain theories, and establishes those truths which ought to constitute the domain of science. Let us add that foresight, which is the wisdom of every wise administration, imperiously demands such a determination.

Every one is acquainted with the influence of precedents; let us ask what effect the establishing of a homœopathic dispensary would have? we should have dispensaries and hospitals for the mesmerists, the brunonian, for animal magnetism, and so on for every conception of the human mind. The government will appreciate as we do the consequences of such conduct.

From these considerations and motives the Academy are of opinion, that the government ought to refuse its sanction to the demand made in favour of homœopathia.

Chloride of Soda (not Chloride of Sodium) in Fever.—In consequence of an error of the press, which escaped our notice, too late to be corrected except by the insertion of an erratum, chloride of soda, the remedy now so much used in France in cases of typhus, and of spotted fever, was erroneously printed chloride of sodium in our last number; although we placed this erratum in the most conspicuous part of that number, viz. at the foot of the chapter of contents, yet we regret to find that this gross misnomer has been reprinted by some of our contemporaries, who have thought fit to notice Dr. Graves's paper on the subject. Among the rest our respected friend, the Editor of the Medico-chirurgical Review, has been misled into printing it *chloride of sodium* throughout the extract which he has honoured us by making from this Journal. Mr. Johnson will perceive the propriety of correcting this mistake in his next number, for *common salt* would be a very inefficient remedy indeed in so dangerous a disease as spotted fever. The medicine used by Dr. Graves is the solution of chloride of soda, as prepared by *Labarraque*, and is, we believe a saturated solution of chloride of soda in water. We are desired by Dr. Graves further to remark, that some misapprehension seems to have occurred in our report with regard to the period at which this remedy ought to be given in spotted fever. It is after the energetic treatment adapted to the first stage of fever has been used, and before the stimulating plan, so often necessary in the latter period of fever, can be commenced; it is when the petechiae or spots have just made their appearance on the surface, and that the patient begins to labour under well marked debility; it is then that the exhibition of the chloride of soda may begin. This period of fever commonly precedes by four, five, or six days the supervention of symptoms which indicate the use of wine and stimulants, pro-

perly so called. When the maculae still keep out on the skin, to use a common expression, and symptoms of putrescence accompany those of debility, then the chloride of soda may be continued, notwithstanding that it is proper to add to the treatment the judicious use of wine and other stimulants.

Acetate of Lead in Asiatic Cholera.—We have received a letter on this subject from Dr. Kingsley, Medical Superintendent of the Cholera Hospital at Roscrea, where upwards of 400 cases of malignant cholera were treated during the late epidemic. Dr. Kingsley states that the epidemic was nearly over when his attention was drawn to the treatment of cholera with the acetate of lead, by an article in the sixth volume of this Journal, where at p. 277 we mention the reasons which induced Dr. Graves to exhibit this remedy in large and frequently repeated doses. It appears from Dr. Kingsley's letter that this remedy has been found serviceable in Canada, and we know that it has saved numerous lives both in Dublin, the provincial towns of Ireland, and in England; its good effects can be testified by many eminent practitioners in Dublin, treated by Dr. Graves, and whose lives were evidently saved by the use of acetate of lead. Very lately some few cases of malignant cholera have appeared from time to time in the neighbourhood of Dublin; among those attacked was a lawyer of eminence, who occupies a prominent situation in this city, and who was treated by Surgeon Read of York-street. The case was extremely violent, and when first seen by Mr. Read was already in the stage of collapse. The effects of the acetate of lead in arresting its further progress were so remarkable and satisfactory, that Mr. Read wrote a letter to Dr. Graves to relate the fact, and thank him for the introduction of so valuable a mode of treatment. At a meeting lately held in the south of England by a provincial association of practitioners in medicine and surgery, a paper was read by the celebrated Dr. Prichard on the chief improvements lately introduced in the practice of physic. Dr. Prichard dwelt much on the use of acetate of lead in cholera, the merit of introducing which practice he proved, by letters in his possession received from Dr. Graves and written before any publication had appeared on that subject, originated with the latter gentleman.

But to return to Dr. Kingsley's communication:—"The notice," continues Dr. K. "of the utility of acetate of lead in cholera, which I read in your Journal, determined me to try this remedy in the next cases which should present themselves. Ten cases occurred early in September, exhibiting symptoms of the disease in its malignant form, viz. purging and vomiting of the rice-coloured fluid, cramps of the abdomen and legs, coldness of the surface, sunk and upturned eyes, pulse nearly extinct, great thirst and wish for cold water, jactitation, &c., evidently indicating that it was not our native cholera which usually makes its attacks in the autumn. The whole of those cases (some of them most unpromising) were successfully treated with the sugar of lead."

Dr. Kingsby ends his letter by expressing his conviction, that the acetate of lead is by far the most useful remedy, that has been hitherto recommended in cholera.

Purpura Hæmorrhagica successfully treated by Bleeding, by Dr. Baker, of Baltimore.—John Beecher, aged 20, of a nervo-lymphatic temperament, called for advice on the ninth of March. He complained of profuse and constant hemorrhage from the gums, which had troubled him for two days, and was preceded by slight rigors. He was a shoemaker's apprentice, and worked in a confined and ill-ventilated alley, sleeping at night in a small garret-room with five or six of his fellow-labourers. His tongue could not be examined, being constantly covered with the oozing blood; his pulse was irritable and excited. Salts and antimony were directed in decisive doses,—iced drinks, an astringent gargle, low diet, and confinement to his bed.

March 10th. Patient no better, had bled prodigiously during the night; his tongue was coated, his pulse tense, and tenderness was manifested on pressing the epigastric region. The medicine had acted freely. The patient was anxious to get up, and, to my surprise, exhibited but little debility, notwithstanding the excessive loss of blood. I determined on opening a vein, and on raising his sleeve, observed in the creases of his arm extravasated blood, of a dark venous character. On further inspection, numerous petechiæ, looking like flea-bites, were seen on the arms, chest, and other parts of the body. A vein was opened, however, and cautious attention directed to the pulse,—20 oz. of blood were taken before the pulse or the patient acknowledged its loss. Ice was ordered, and the ice gargle continued. 9, p. m. Patient better; the hemorrhage continues slightly, pulse calm. Prescribed, *P. Gum opii, acetat. plumbi, &c. grs. ij.* The blood which was abstracted in the morning did not separate completely, but presented a dark, thin, jelly-like appearance. 11th. Patient better; hemorrhage ceased; directed Seidlitz powders occasionally, and as soon as practicable, a visit to the country. He called a month afterwards, to report himself completely well.

Remarks.—The detail of the treatment in this case is of but trifling importance, and I am persuaded might have been conducted much better. The main point is the general principle to which the disease yielded. The remedies employed were decidedly antiphlogistic. The case certainly wore an alarming aspect, and the loss of blood was so great, that I am unwilling to publish an estimate of its amount. *Purpura hæmorrhagica* has been conceived by some to be a disease of debility, by others inflammatory in its character. It might seem unwarrantable to generalize from a single case. But it occurred to me, that the confined and tainted air of the alley, the scanty diet, the sedentary life, the crowded garret, had so impaired the nutritive function in Beecher, as materially to impoverish the blood—the whole system was weakened and relaxed by the same cause. A chill

and a fever came on, and the force of the circulation was competent to throw this thin and dissolved blood through the non-resistant capillary tubes;—non resistant, because weakened and toneless under the operation of the remote causes. Two indications were then to be fulfilled;—to subdue the unnatural force of the circulation; and to give tone to the general system. I saw no evidence to sustain the opinion of some, that this disease consists in an inflammation of the venous radicles.—*North American Archives*, July, 1835.

C'est par tout comme chez nous.—Dr. Smith Professor of Surgery in the University of Maryland, introduces the following observations in a paper containing contributions to pathology in the *North American Archives* for June, 1835.—“Notwithstanding the important revolution that has been effected in the method of studying and teaching anatomy, there are still too many who adhere blindly to the old routine, and instead of directing their attention to those investigations, which are calculated to render their labours a fruitful source of instruction to those for whose edification they are specially intended, content themselves with a tedious enumeration of forms, and prominences, and foramina, and insertions; which the student can seldom remember, and if he could do so, would never be able to apply them to any useful purpose. And these are the persons who decry general anatomy! who discourse learnedly about the necessity of giving to lectures a *practical* character, and by a specious sophistry, divert the minds of their pupils from that train of investigation, which is indispensably necessary to make them either good physiologists, sound pathologists, or successful practitioners.

“But lest we should be charged with attaching an undue importance to those pursuits to which we have been ourselves devoted, and condemning too strongly the course of those who possess different sentiments, we shall allow one to speak, who cannot be accused of being influenced by such a bias. A writer in the *Medico-Chirurgical Review* for January, 1835, p. 138, holds the following language in reference to this subject:

“It is impossible for any who are conversant with the method of teaching anatomy now practised in the *best* metropolitan schools, to avoid perceiving the great alteration which that method has experienced in the last few years. Mr. Abernethy, we believe, was the first to adopt a slip-slop mode of lecturing, in which minute and rigid demonstration was sacrificed, and a very superficial description of anatomy was patched and garnished with trimmings of physiology, pathology, and therapeutics. The lecturers of the Abernethian school resembled very closely that liberal cook, who offered for three-pence, a dinner consisting of ‘roast and boiled.’ He kept his word; but, when the covers were removed, potatoes were the only dish.

“The abandonment of minute anatomy, and the association of pathology and surgery along with it, offered a short cut and an

easy path to the deluded student. The lecture room and manual were occupied alike with his very promising and very profitless species of instruction. Much was said, but little taught; and if the student had not the fortune to be made a jack of all trades, he certainly was not a master of anatomy.'

"A better picture of the practical lectures on anatomy of the present day, could scarcely be drawn, and we regret to say, that the American, as well as the British schools of medicine, still abound with too many examples to which the likeness will apply. Would we could hope for the consummation of the sentiment expressed by the able writer just referred to—that 'such lectures will be shunned as idle praters or absolute impostors, and that the race of *fainéants* must quickly disappear.' We would most cheerfully join with him in his benediction, 'peace to their manes!' as we do in the belief, that 'they belong as certainly to a former age, as if they had been born two centuries ago.'"

Supposed Case of Poisoning by Ergot of Rye; a word to the wise,
by Dr. Hulse of Pensacola.—The effects here described occurred from an overdose of ergot, in a lady of delicate constitution, who has a peculiar idiosyncrasy against all the narcotics. The ergot used on this occasion was supposed to have lost some of its activity from age.

Mrs. H. was delivered of a healthy male child, August 14th, 1834, at half past 8, A. M., after a labour of six hours. The labour pains were extremely violent, and in quick succession. She frothed at the mouth near their close, and the dilatation of the pupil gave to the eyes the expression of a vacant stare. The hemorrhage was profuse, and an attempt was soon made to take the placenta. It was found attached, however, and an effort to introduce the hand produced fainting. At this time ergot was given: R. secal. cornut. 3 i. aqua bullient 3 viij. one-half of this infusion for a dose, the balance in five minutes. This caused a few contractions of the uterus, and the hemorrhage ceased. The patient was supported in her exhausted state with a few drops of tr. camphoræ, given occasionally. In this condition she remained till 11, A. M. the next day. During the interval she took a few drops of acetum opii, and slept about an hour. Ergot was now given, in doses as above, every half hour, until 3 xii. of the infusion had been administered. The uterus, which had been inactive for many hours, gave two or three strong contractions soon after the first dose, and then relapsed into a state of quiescence. At this juncture I resolved, notwithstanding the great sensibility of the parts, to introduce the hand, and take the placenta at all hazards. I reached the placenta, however, near the os externum, and finding it detached, brought it away without causing pain. I soon perceived that my patient was in a state approaching insensibility. The pulse was feeble, about sixty-five, and the limbs were covered with a cold sweat. Ordered wine and water.

Shortly the palpebræ began to swell, likewise the lips and fauces ; the tears flowed copiously ; the Schneiderian membrane seemed much stimulated, and there was coryza, great difficulty of breathing through the nose, and injection of the vessels of the conjunctiva. The lips and palpebræ began to puff as if stung by a bee, and gradually assumed a livid appearance. The power of deglutition was now nearly lost ; the voice became feeble ; she said her jaws were fixed, and shortly after it was with the greatest difficulty that an answer of yes or no could be elicited. Previous to arriving at this point, she had complained of pain in every *nerve*, and a sensation of emptiness of the head.

I felt confident my patient had been poisoned by the ergot. I had a dose of sulphate of zinc prepared, but concluded it was doubtful whether emesis, at that late period, could be produced, as my patient gave evidence of great exhaustion, she having no power to move the lower extremities, and but very little control over the upper. I gave carbonat ammon. gr. v. dissolved in a wine glass of cold water, every half hour, and used frictions over the whole body and limbs, with the strongest liniment of ammonia. There was an amelioration after the second dose, the pulse rising, and the skin becoming warm ; and after the third, the symptoms had so far subsided as to render it unnecessary to continue the remedies. On recovering the power of speech, she informed me that her head had seemed to be perfectly empty, and that the sense of hearing had become so heightened, that every word spoken, in the lowest tone, reverberated through the head, and passed through every nerve over the whole body. She seemed to herself to have been totally deprived of the natural warmth of the body, which was restored by the frictions. The symptoms all disappeared in a few hours, except the redness and tumefaction of the palpebræ ; which remained in a slight degree on the following morning. As the pulse rose, and the patient recovered, there was a general perspiration, the matter of which emitted the peculiar fetor of ergot. She rose from her confinement without any untoward event.—*North American Archives for May, 1835.*

On Inverted Toe-nail, by Dr. Smyth, Professor of Surgery in the University of Maryland.—Although, at first thought, this disease may appear to be one of trivial character, and although it is one which never threatens life, yet I know of but few which create a greater amount of suffering—so frequently does it occur, and so severe is the distress which it often occasions. I have, indeed, in some instances, known it to be attended with such extreme irritation as to seriously impair the general health : and I have known amputation to be improperly resorted to for its relief.

Those writers who have noticed this disease have uniformly described it as an actual inversion and growing downward of the margin of the toe-nail. Having noticed carefully, in my own

person, the causes which produce the disease, and the mode of its production, I am satisfied that the commonly-received explanation is erroneous.

These diseases would never occur to those who wore neither boots, shoes, nor stockings. Indeed it never occurs to the negroes of this section of the country, who generally wear no shoes except during the winter season. The shoe or boot, then, (but sometimes the stocking,) is the remote mechanical cause of it. The mode in which it operates is this:—the shoe being, as it usually is, too narrow to allow the anterior part of the foot to expand when it receives the weight of the body; or the heel of the shoe being so high as to cause the foot to be thrust forward into the narrow part of it, the toes are cramped and compressed upon each other. The great toe, particularly, receiving the greatest pressure, is forced outward and against the second toe, and is made partly to mount upon it. The second toe, being smaller, presses not directly against the side of the large one but partly under it, pushing the soft parts upward, and doubling them over the outer edge of the nail. A species of inflammatory hypertrophy takes place in the extremity of the toe from the continued irritation of the nail; and the soft parts, which are thus reflected over its border, become more voluminous than natural. I have often thus seen it doubled quite over to the middle of the top of the nail. The end of the toe itself also becomes permanently swelled and expanded, and rises anterior to the angle of the nail. The pressure of the shoe on the top of the nail, no doubt assists in some degree the production of the disease.

Very rarely does the disease occur at the inner margin of the nail, as it certainly would as frequently do, if the common explanation of the production of the disease were correct. When it does there occur, I am confident that it arises from the soft parts being pressed upwards from below, and the nail being resisted above.

When the flesh is pressed upon the edge of the nail, ulceration will necessarily result and pus is secreted. Occasionally blood flows. Redundant spongy and irritable granulations occur, and increase the tumour of the parts, which rise above the margin of the nail, and give to it the appearance of having grown into the flesh, and of being deeply buried in it.

The elastic pressure of the stocking more frequently inflicts injury upon the toes than is generally supposed. The material is so soft and yielding, that few suspect the evils of tight stockings as well as of tight shoes. The continued pressure of a substance as soft even as the texture of a stocking, is capable of greatly modifying the form of parts. I was not long since consulted in a case of dislocation of the lower jaw, in which the character of the injury not being recognized, no reduction had been effected. The displacement had existed nearly a year. Surgeons are aware how difficult it is for the patient, after dis-

location of the jaw, to close the mouth, and retain the saliva, even when inflammation has passed away. Strong contraction of the lower part of the orbicularis is produced for this purpose, and almost continued pressure is made upon the lower incisor teeth. In this case, by the pressure thus made, the teeth, which before had been natural and strong, were thrown horizontally backward into the mouth.

Upon one occasion, when suffering in my own person from the irritation of the inverted toe-nail, I changed my shoes for those which were abundantly wide at the toe, but still I felt the same painful compression of the toes, when standing or walking. Further attention to the cause shewed that it was the continued pressure of the elastic stocking.

For want of proper attention to the cause, as I believe, the surgeon is often long baffled in the treatment of this disease. So often are the ordinary means defeated, that Dupuytren has recommended and practised an operation of great severity for its radical cure. He thrusts the blade of a pair of scissors beneath the anterior margin of the nail, near its centre, and carrying it parallel to the lateral border, reaches the root. He then divides the nail, and seizing the portion concerned in the disease with forceps, tears it away. This is said by the surgeon not to be particularly painful, but I think it will require more than the assurance of the operator to convince us that it is not agonizing. Such an operation will undoubtedly be effectual, but besides its cruelty, it impairs the integrity of the member. The toe-nail is by no means a superfluous appendage, and therefore it is desirable to preserve it.

In the treatment of this affection, let the surgeon first carefully consider the cause, and endeavour to effect its removal. This I have accomplished by interposing between the toes, at their roots, a cylinder of soft, rolled linen—perhaps a third of an inch in diameter, or as large as may be necessary to keep the extremities of the toes from pressing upon each other. A shoe is to be worn which shall give abundant room for the toes to expand, but furnish snug support to the instep; for a shoe which is altogether loose upon the foot, will allow the toes to be pushed forward upon the toe of the shoe. The patient must also wear stockings which shall not in the slightest degree compress the toes. If the disease be not far advanced, the parts being relieved of the cause, will soon spontaneously assume their healthy condition. But if there be morbid granulations rising, in which the border of the nail is buried, and this last appears to be creating great irritation, it is necessary to gently raise the border of the nail by seizing the corresponding anterior angle with forceps, and then, with delicate scissors, the free lateral margin, which will be found macerated, white, soft, and brittle, should be cut away. To the granulations the nitrate of silver may be applied. The toe-nail should now be scraped thin upon its dorsum, and the patient should be directed every day to lift the

border of the nail. I have found no advantage in thrusting anything under the nail to keep it raised, but have seen such substance cause much irritation.

In confirmation of the correctness of our pathology and treatment of this distressing affection, I may add that, when patients labouring under it are by other disease confined to their beds, without wearing stockings, the disease invariably disappears, and does not recur until they have been for some time on their feet.—*North American Archives*, March, 1836.

Dr. Hutton requests that the following correction of errors, which unfortunately crept into the report of his paper in the last number of our Journal, should be inserted here.

“ Page 213, line 11, after the words, ‘ This is the more extraordinary as’ insert the clause, line 28, beginning ‘ the late Baron Du-puytren is said,’ and ending ‘ Leçons Orales.’ ”

“ Page 215, line 12, after the words, ‘ about the joint,’ insert the clause, line 22, beginning ‘ It is only necessary,’ and ending ‘ the disease of the joint.’ Same page, line 32, for ‘ embarrassing’ read embarrassed.”

An Editor to his Constituents.—In the last number of Silliman’s American Journal of Science and Arts we find the following candid appeal; as we admire plain speaking and coming at once to the point, we insert it here, as a good hint to those who growl if they have no Journal, and when the Journal is supplied, growl because they have to pay for it.

To the Friends of Science and of Useful Knowledge.—This Journal, having been sustained for seventeen years, the editor has no doubt that it is his duty to report its present critical situation to his countrymen, especially as the response was prompt and effectual, when, six years since, he made a similar appeal. He conceives himself justified in taking this step again, since a Journal of this nature (the only one that this country has ever long sustained) is not less the concern of the public, than of the individual who conducts it. Its important bearing on our reputation and our interests, is generally acknowledged, and should it be left to die of penury in the midst of abundance, its editor will exonerate himself from blame, and will lay both the injury and the dis-honor at the door of his country. He therefore at once proceeds to state, that unless reinvigorated by an enlarged list of paying subscribers, this Journal cannot be permanent. The obvious causes are, a progressive diminution in its patronage, and the want of good faith in too many of those who have given in their names. A great majority, however, to their honor, have been faithful and punctual in every vicissitude, while a considerable number order the work, but make no returns.

“ Notice of discontinuance or of removal is often neglected, until several numbers rest unclaimed in some, perhaps, distant Post Office; or they are returned, with a dishonored bill. It is

long since the losses of the Journal in this way have swollen to a heavy sum, implying a serious charge upon the honor and moral rectitude, of many, who would resent the imputation. After paying the bills of the 27th volume for paper, printing, and doing up, the trifling sum remaining presented the anxious alternative of a discontinuance, or of the renewal of a personal charge upon the editor.

"It is not agreeable to tell this tale of dishonor. To a country of unlimited resources, and proud to a fault of its intelligence and liberality, it will not be acceptable; and should the charge of arrogance be retorted, it must be patiently borne, until the country shall decide, either that it will sustain no general Repository of Science, or that it will sustain only a better one than the present.

"The American Journal has undoubtedly its imperfections, but it is the best which the circumstances of an individual have enabled him to produce.

"An eminent foreign Savant, in a letter now in view, writes from London to the editor, under date of December 28, 1834—"It is admitted, by all with whom I converse, that the American Journal is the best and most original Journal in the English language." We cannot expect the opinion of a partial foreign friend (although a very competent judge) to guide the public sentiment of this country; nor can we exclaim with the Roman poet,

"Exegi monumentum aere perennius."

"Still, when, by the fortune of war, we shall be cut down, and our dishonored flag shall lie in the dust, it may, perhaps, be recorded on our humble stone, that the leader of a forlorn hope fell in the breach, and left it open, that wiser and better men might enter.

"*Plan.*—May we presume again to recommend the simple expedient adopted, in case of this Journal in 1839, namely, that each subscriber should kindly endeavour to obtain one more. In this manner, with little trouble to any one, the subscription might be soon, as it then was, doubled; the work would then be secure again for a series of years, and its capabilities of usefulness would be greatly extended.

"In this country, such a work, involving peculiar difficulties, can neither be got up, nor sustained, without great effort and perseverance. Avoiding all local, personal, and party interests and excitements, it thus entirely foregoes the support afforded by popular feeling, and therefore relies, as it has a full right to do, solely upon the intelligent, the interested, the patriotic, and the philanthropic.

"For the support of such a work, it is worse than useless, to resort to indiscriminate solicitations. The transient subscriptions, obtained in that manner, will produce only a delusive expectation of support, and a certain increase of expense.

"Such persons, therefore, and such only, should be addressed, as, from their considerate and correct estimation of the value of useful

knowledge, or from their interests and taste, will probably become permanent patrons."

Creosote.—The last October number of Dr. Johnson's Medico-Chirurgical Review not having come to hand until our Journal was nearly printed, we are unable to avail ourselves of its valuable contents for the instruction of our readers. We however take the liberty of extracting this article at length from his *periscope*:—

"As this powerful stranger, which has lately made its way into therapeutics, is occasioning considerable curiosity, we shall here introduce an account of its properties, mode of preparation, and medicinal agency, from a recent edition of Dr. Gully's 'FORMULARY OF NEW MEDICINES,' published by Churchill.

"The name of this new remedy is derived from the Greek *ξηστός*, flesh, and *σώζειν*, to preserve. It was discovered last year by M. Reichenbach de Blansko in pyroligneous acid, in the first instance, and subsequently in the different kinds of tar.

"In the process which led to the discovery of creosote, M. Reichenbach found that his fingers were deprived of their epidermis, and he conjectured, from this vehement action on organic matter, that this substance might be the mummifying principle of pyroligneous acid, and might also serve an important therapeutic purpose in the living body. This explanation has since been realized.

"Physical Properties of Creosote.—Creosote is an oily, colourless, transparent liquid, of a penetrating odour, resembling that of smoke, or smoked meat, and of a burning and exceedingly caustic taste. It has a specific gravity of 1,037.

"Chemical Properties.—It boils at 203° Centigrade, and is not congealed by cold of 27° C.; it burns with a strongly fuliginous flame. With water at 20°, it forms two combinations, one a solution of one part in 80, and the other of 10 parts in 100. This aqueous solution does not change turnsol, nor is it neutralized by acids or alkalies. Nitric acid causes red vapours. A small portion of concentrated sulphuric acid turns it red, but a larger quantity blackens it, the acid itself being also decomposed. Acetic acid seems to be its specific solvent, for it holds any quantity of it. All the acids, even the carbonic, separate creosote from its combinations with potass and soda, without otherwise affecting it. It dissolves a great number of salts, some with, and some without heat. Alcohol, ether, carburetted sulphur, and acetic ether combine with it in any proportion. It decomposes or dissolves resins, resinous colouring matters, and other similar substances.

"Shaken with white of egg, coagulation immediately takes place. Fresh meat, soaked for an hour in a solution of creosote, and then dried, may be exposed to the sun, without fear of putrefaction; in a week it becomes hard, has the smell of smoked meat, and becomes reddish-brown. Fish may be preserved in the same manner. Birds poisoned with creosote, remain nearly two months without emitting any putrid odour.

"These effects on animal matter closely resemble those of pyroligneous acid and tar-water, and demonstrate, almost to a certainty, that creosote is the preservative principle of those fluids. This, however, has been further shown by the extraction of creosote from both of them. I shall confine myself to the preparation of creosote from tar, as it is procured more abundantly, and by an easier process, from that substance.

"*Preparation of Creosote.*—In the dry distillation of tar from wood, the fluid collected in the receivers contains an empyreumatic acid water, which is rejected, and oil of tar, which is placed in glass retorts and rectified. In these two distillations the oil of tar is at first light, but as the heat is increased, its gravity augments. At one period of the process the oil sinks to the bottom, and a fluid which is poor in creosote, and consists mostly of euphone, and other substances that interfere with the purity of the creosote, floats above it: this is poured off, and the pale yellow tar-oil is heated. Carbonate of potass is added, until the carbonic acid is no longer disengaged on shaking; the mixture is decanted, in order to separate the acetate of potass, and the oil is again distilled in a glass retort, and all the first products that float on the water are rejected. The oil is then dissolved in a solution of caustic potass of the specific gravity 1.12; heat is thereby developed, and a portion of the materials composed of euphone, &c. not being dissolved, floats on the surface, and is removed. The alkaline solution is poured into an open capsule, and regularly heated to boiling. It rapidly absorbs the oxygen of the atmosphere, whereby a peculiar oxidizable principle in it is decomposed, and the mixture then turns brown. After cooling in the open air, diluted sulphuric acid is added until the oil is set at liberty. It is then distilled with water, holding a little caustic potass, and the whole is kept boiling until the quantity of oil which passes from the retort becomes diminished; at this point the distillation should cease. The oil and water in the receiver are again distilled with potass, and the same treatment with sulphuric acid repeated, as in the former instance. A third distillation is then made, and a little phosphoric instead of sulphuric acid is added, in order to take up some ammonia retained in the oil.

"The oil is then for the third time dissolved in caustic potass, and if the preceding processes have been carefully managed, they combine, without leaving any residue of euphone, and the mixture, on exposure to the air, does not turn brown, but takes on a slightly reddish tint. As long, however, as any euphone remains, and the mixture turns brown, the solution in potass should be repeated. In this state, the creosote is not entirely pure, but it may be used for medicinal purposes.

"It may be obtained perfectly pure by distilling it with water alone, then rectifying the product of the distillation repeatedly, until no water passes over when the heat is raised to 203° C. The last product is creosote unalloyed by euphone, picamare, water, or other matters.

“ M. Reichenbach endeavoured to simplify this tedious process ; but he found that the product was always unfit for internal use, while its action on the surface was much impaired. So procured, its emetic effects were most violent ; a single drop applied to the tongue caused, in the space of a minute, excessive nausea with tremors, succeeded by vomiting, and great prostration of the powers. These effects he attributes to the presence of eupione, and he therefore recommends the process above-described to be followed on all occasions.

“ *Physiological Action of Creosote.*—Applied on the tongue in a concentrated form, creosote causes violent pain, though no redness or tumefaction is present : a strong taste of smoke extends to the throat. Poured on the skin, it produces a burning sensation with rubefaction and erosion.

“ Flies, spiders, and small fishes die in the course of two minutes, when immersed in a solution of twelve drops of creosote, in two ounces of water.

“ Two drachms given in half an ounce of water to a puppy-dog induced the following symptoms ; complete prostration of muscular power, drooping of the head, fixation of the eyes, vertigo, apparent stupification of all the senses ; the respiration, from being laboured, was at the end of three minutes almost entirely stopped by an abundant secretion of viscid, filamentous mucus ; to which was added vomiting of whitish milky fluid, with spasmodic contraction of the abdominal muscles. These symptoms got gradually worse for two hours, the respiration becoming more laborious, and at longer intervals, the limbs being seized with tremors, then with convulsive contractions, and the whole ending in death.

“ On opening the body of the animal, all the tissues of the body, except the liver, exhaled a strong odour of creosote. The mucous digestive membrane gave signs of inflammation throughout its whole extent ; the matters contained in the stomach coagulated white of egg, and, heated, gave out the powerful tar-smell of creosote. In the heart and the immediate great vessels the blood appeared to be much more firmly coagulated than usual. The lungs were gorged over the greater part of their extent with reddish-brown blood ; the more ruddy parts of them floated in water readily : the darker portions scarcely swam at all. No sign of congestion about the brain appeared.

“ On injecting equal parts of creosote and water into the carotid artery of a dog, the same symptoms were produced, but death ensued more speedily.

“ If concentrated or diluted creosote be added to blood, the latter thickens and becomes reddish-brown, with small spots of white, probably coagulated albumen : on further exposure to the air, the blood passes to a yellowish-red colour.

“ The signs of poisoning with creosote, therefore, are the redness of the gastro-intestinal mucous membrane, the peculiar thickness and colour of the blood, the property possessed by the matters in the stomach of coagulating albumen, and more especially the peculiar odour exhaled by all the tissues of the body.

"Plants watered with a solution of creosote, fade and die in the course of a few days.

"Medicinal Employment.—M. Reichenbach's first essays of his newly-discovered remedy were made on slight burns, infantile excoriations, and wounds. Subsequently he was induced to try it in extensive burns by hot iron and boiling fluids: in itch and various kinds of tetter: in gangrene consequent on extensive compound fracture of the leg: in caries of the phalanges of the fingers and toes: in tooth-ach, though it fails to put a stop to the caries of the tooth: in open, fungous whitlow; in scrofulous ulcers of the throat, leg, and joints of the fingers: in ulcerated white-swelling of the knee of two years' standing: in chancres and other syphilitic ulcers: in wounds from cutting and piercing instruments, caustic alkalies, &c., in which cases the wounds did not cure by suppuration, but by actual desiccation caused by the creosote. In all these instances he has found the remedy most effectual and astonishingly rapid in its operation. Thus in a case of old-standing and scrofulous ulceration of the throat, with purulent discharge from the ears, the ointment of creosote to the former, and the injection of creosote water into the latter, put an end to both in the course of three weeks.

"Internally, M. Reichenbach has given it in several cases of hemoptysis; in two of these, the sanguineous expectoration had continued for upwards of a week, when the administration of four drops of creosote, on sugar, daily for four days, arrested the flow of blood.

"Turning to the practice of the French physicians, we find that creosote has been successfully employed in burns by Berthelot and Goupil, who observe, that in treating these with creosote, the tendency to cicatrize from the circumference to the centre, and the consequent contractions and irregularities, are avoided; in various dry and moist tetter by Goupil, Coster, Berthelot, Martin-Solon, Duchesne-Duparc, and Dauvergne: in chancres and old venereal ulcers, by Künckel, Lesseré, and others; in sanious ulceration of the cervix uteri, by Colombat: in a cancerous ulcer of the nose, by Breschet: in chronic inflammation with suppuration of the edges of the eyelids, by Costar: in cancer of the womb, by Hypolite Cloquet and Tealier: in varicose, ill-conditioned ulcers of the leg, by Goupil, &c. Chilblains are also considerably benefitted by frictions, with creosote ointment or water. M. Regnart, of Paris, among many other patients, had the good fortune to relieve the gifted Broussais from an excruciating tooth-ach, by the free application of concentrated creosote to the carious tooth; we cannot wonder that the worthy professor should be an advocate of the doctrine of 'irritation.'

"As this application of creosote may be of more extensive and familiar use than many others, it may be well to inquire how it acts as a sedative in this instance. When the teeth are painful it is almost always because the nervous pulp near to the root is exposed to the contact of the air. If in this circum-

stance a few drops of undiluted creosote are applied, a fierce increase of pain is the first effect, then a total cessation of it; in this, either the nervous pulp is destroyed as by some caustic: or the creosote, by coagulating the albumen of the fluids that are always flowing from the caries, forms an albuminous layer that defends the pulp from the air; or lastly it acts as a powerful stimulant, causing the inflamed vessels of the pulp to contract and expel the load of blood by which they are oppressed. In any case the pain is apt to return, and this fact is only explicable by one of the two latter suppositions: for so long as the irritating cause, carious bone, remains, so long are the vessels of the pulse liable to relapse into their former congestion.

“Creosote has been employed by the French physicians in pulmonary phthisis, but from all that I have read on the subject, the alleged successful cases are strained, and should not be recorded as such. It has not been more successfully used in several cases of chronic bronchitis by inhalation.

“British practitioners have not as yet essayed the effects of creosote, and indeed this is too often the case with regard to new remedies. My friend, Dr. Copland, however, is an exception to this rule; he tells me he has employed it in cachectic affections as a tonic, and also in dropsical cases, where it has proved diuretic. In two cases of diabetes, he considers that he was not allowed to make a fair trial of it. The dose he gives is generally from $\frac{1}{2}$ to 8 maxima three or four times a day, combined with powdered liquorice root, into pills. In porrigo favosa, he has used a lotion of a saturated solution of creosote with good effect.

“My own experience of the effects of creosote is as yet confined to cases of scrofulous ulcers of the leg, tooth-ach, lumbago, and aphtha. In the first case, of ulcers, I premised a seton in the arm; and the rapid desiccation of the ulcers caused by the creosote had no ill consequence on the brain or any other viscera. In tooth-ach I have verified the reports above alluded to. In the case of rheumatism I found the remedy at first produce distressing nausea, but the warm and copious sweat that ensued soon compensated for that symptom, and effectually removed the rheumatic pain; copious diuresis was also one of its effects.

“In a case of extensive aphthous ulceration of the mouth occurring in an adult, I employed the following wash with the greatest advantage; the sloughs came away after the second time of washing, and the depressions in the mucous membrane filled up with astonishing rapidity; several of the ulcerated surfaces were as large as half of a sixpence.

“Creosote $\frac{1}{2}$ a drachm
 “Gum Arabic mucilage, 1 $\frac{1}{2}$ ounce
 “Camphor Mixture 10 $\frac{1}{2}$ ounces
 “Mix.

“To wash the mouth every two hours.”

• *New Medical College, Calcutta.*—We perceive from the Asiatic

Journal for September that a medical reform has been consummated where, till now, we were not aware that any establishment of the kind existed to be subjected to this fashionable process; but so it is. The Governor General in council resolves as follows;— “The Sanscrit College medical class of the Mudrussa, and the native medical institution is abolished.” *Abolished!* ominous word; next year it may be merely the substitution of the words, the Medical and Surgical Colleges of Dublin, for the word Mudrussa. Next, “a new College shall be formed for the instruction of a certain number of native youths in the various branches of medical science:” so far so good; if one college be abolished, it is right that a new one should be erected in its stead. Then, “all candidates for admission as pupils, shall be required to present certificates of respectability of connexions and conduct.” This is, of a surety, queer reform, which requires certificates of respectability; what will the honorable member for Finsbury say to that? More; “the pupils shall each receive a monthly stipend of seven rupees.” Best of all. What blockheads have the men, who engross all the honesty, been, not to hit on a suggestion of this kind. Surely the pupils should be paid for listening to some lectures at least. “Pupils are required to learn the principles and practice of the medical sciences in strict accordance with the mode adopted in Europe.” In the next paper we shall perhaps see an announcement of the terms of dissections in Calcutta. The next regulation runs thus: “As an inducement for pupils of a respectable class to enter the institution, the pay of the native Doctors who shall have been educated at the College shall be thirty rupees per month.” The honorable member for Bridport may here cry *eureka*, and Dr. Hume, now that he is out of the service, will no doubt give notice of a bill, to cut off the odd five pence a day, and reduce the Doctor to two shillings. But what follows. “The superintendent of the College shall draw a staff allowance of 1200 rupees a month, in addition to his regimehtal pay and allowances.” Here is the climax; Hakim gets one rupee per day for his laborious duties and Sahib superintend forty, in addition to pay and allowances, which may be forty more. No wonder that the medical class of the Mudrussa was abolished.

Action of Mushrooms on Atmospheric Air, from a Memoir by M. F. Manet, read to the Soc. de Phys. et d'Hist. Nat. de Geneve.— The following are the results of a series of experiments conducted to determine the above question:

1st. Mushrooms, whilst growing in atmospheric air, produce upon it changes very different from those which are effected by green plants placed under similar circumstances. Mushrooms very speedily vitiate the air, both by absorbing its oxygen, to form carbonic acid gas at the expense of the carbon of the vegetable, and also by the disengagement of carbonic acid gas, formed on all occasions when the experiment is conducted for a sufficient length of time.

2nd. The changes which the atmospheric air undergoes from the growth of mushrooms appears to be the same both day and night.

3rd. If fresh mushrooms are placed in pure oxygen, a great part of the gas disappears at the end of some hours. A portion of the absorbed oxygen combines with the carbon of the plant, whilst another portion appears to enter into the vegetable, and to be replaced, in part at least, by the nitrogen disengaged from the mushroom.

4th. Fresh mushrooms, by remaining for some hours in pure nitrogen, change very little the nature of this gas. The only effect produced is confined to the disengagement of a small quantity of carbonic acid, and in some cases to the absorption of a very trifling quantity of nitrogen.—*Edinburgh New Philosophical Journal*, October, 1835.

Distinctive Characters of the Dog, the Wolf, the Chacal, and the Fox, by M. Marcel de Serres.—M. de Serres says, “our place of residence, unfortunately, has not allowed us to give to the investigation all the perfection it might receive. At a distance from a great museum, which, from the mania for *centralization* which afflicts France, is to be found solely at Paris, we have not been able to procure those means of comparison which are indispensable.” We thank M. de Serres for the word ; centralization, in France, we take it, corresponds to *assimilation* of political slang as applied to Ireland and its institutions, and we hope the complaint conveys a lesson calculated to rouse that description of spirit, which alone can resist the contemplated spoliations of certain selfish impostors, who, under the tattered mask of reform, expect to be permitted to centralize with impunity. But leaving those wolves and foxes, let us turn to those more immediately under consideration. The distinctive characters upon which M. de Serres relies are derived from inspection of the skeleton ; he says :

“At all events, however, we have done our best to avail ourselves of the collections which have been formed by the Faculty of Sciences at Montpellier, the result of that ardent zeal which animates them in the promotion of anatomical science. When heads of different races of dogs are examined and attentively compared with those of the wolf and fox, it may easily be observed that differences exist between them much more important than those which result from the relative size.”

But we must break off abruptly, referring our readers to Professor Jamieson’s valuable Journal for the remainder of this interesting communication, the Printer warning us that if we write more we must write on the cover.—(*Bibliotheque Universelle*.)—*Edinburgh New Philosophical Journal*, October, 1835.

THE
DUBLIN JOURNAL

OR

MEDICAL AND CHEMICAL SCIENCE,

1 JANUARY, 1836.

PART I.
ORIGINAL COMMUNICATIONS.

ART. XV.—*On the Infra-orbital Cavities in Deers and Antelopes, called Larmiers by the older French Naturalists.*
By ARTHUR JACOB, M. D., Professor of Anatomy in the Royal College of Surgeons in Ireland.

[Read at the Meeting of the British Association held in Dublin, August, 1835.]

IN compliance with the recommendation of the committee of the Zoological Section of the Association made at the meeting in Cambridge in 1833, I have availed myself of such opportunities as have been afforded me of investigating the nature, structure, and uses of these remarkable parts. To those altogether unacquainted with the subject it is necessary to state that they consist of two oval depressions about an inch and half long, half an inch wide, and more than three quarters of an inch deep in the majority of instances; situated on the side of the face, and so near to the inner angle of the eye that they create a very reasonable suspicion that they are connected with

that organ, and hence the term *larmier* applied to them. The bottom of the depression is in most cases naked, but in some it is covered with the hair, consequently it is composed of the skin formed into an open sac, accommodated in a corresponding depression in the bones of the face. In many animals provided with this organ a gutter, formed by folds of skin, leads so directly to it from the surface of the eye that the passage of the tears from the one place to the other appears inevitable; while in others this communication is so imperfect that a doubt is at once raised as to its destination to such a purpose. If the part in question be not a cavity, as suggested by some, in which the overflowing secretions from the surface of the eye are disposed of by evaporation, another reason for its existence must be assigned. The arguments which may be urged against the supposition that it is destined to receive the tears are, first, that it exists in the antelopes and deers only, and is even absent, or merely rudimental, in many of these; while in animals said to be destitute of the usual canals for carrying off the tears to the nose, as the elephant and hippopotamus, it is absent; secondly, that the solid concretions generally found in it are not composed of such ingredients as the tears and other secretions from the surface of the eye should afford.

If the conclusion that these are cavities for the reception of tears be discarded, their identity of nature and character with the numerous provisions for the secretion of peculiar or odoriferous materials suggests itself. In many instances, especially in the mammalia, glands are found opening on the surface of the skin, and pouring out peculiar fluids, sometimes altogether unconnected with any organ; such are the glands on the side of the head between the eye and ear of the elephant, those described by Tiedemann between the eye and nose in certain bats, consisting of a sac with a folded lining membrane, affording a foetid, oily secretion, and beneath the eye in the marmot and two-toed anteater; such also are the glands on the side of the chest of the shrew, described by St. Hilaire, and the inguinal glands of

hares. Still more remarkable examples are furnished by the pouches, affording the valuable odoriferous materials in the musk, beaver, and civet; and if additional examples be required, they are found in the otter, male hyena, ichneumon, badger, and the dorsal gland in the peccary. That the cavities alluded to in the deers and antilopes afford peculiar and often odoriferous secretions, is established on the authority of several naturalists. Buffon describes the contents in the stag as resembling ear-wax. Daubenton found the secretion in an old stag so much indurated as to constitute a solid mass, or bezoard, as he calls it, eleven lines long, seven broad, and six thick. Camper found hard, yellowish particles in the fallow deer. In a species of antelope first described by Dr. Herman Grimm, this organ secretes a fluid of such peculiar and distinct character that no doubt can be entertained of its nature. He describes it to be a yellowish, fatty, and viscous humor, having an odour between musk and camphor. Vosmaer says that it hardens, and becomes black in time, and that the animal rubs it off on the rails of its cage, but he could not detect the musky odour. Pallas, who describes the antelope *grimmea* particularly, concurs in these observations.

It may be objected to the conclusion, that these are organs for the production of an odoriferous secretion, that the sac exhibits so little of glandular character that it appears inadequate for the purpose, especially when several of the external openings alluded to, as that on the head of the elephant and the back of the peccary, are merely the outlets of considerable glands; but on the other hand, many organs of this character are mere sacs, as that on the face of the bats, the bottom of which presents a peculiar folded appearance, and the cavities in the musk and beaver, which afford the odoriferous secretion in such large quantity.

A statement respecting these infra-orbital cavities has been made by the Rev. Gilbert White in his *Natural History of*

Selburne, which might appear to originate in some error were it not supported by the more recent testimony of Major Hamilton Smith. These gentlemen state that when the deer drinks, the air is forced out through these cavities, and, according to Major Hamilton Smith, may be felt by the hand, and affects the flame of a candle when held to it. Notwithstanding such a positive statement by two observers of established character for faithful description, the passage of air through these cavities cannot take place, they are perfectly impervious toward the nostril; but I have no doubt that the fact stated is correct, the air which escapes passes, not through the infra-orbital sacs, but through the lachrymal passages, which are very large, consisting of two openings capable of admitting the end of a crow's quill, the entrance to a tortuous canal, which conducts the tears to the extremity of the nose. Introducing a pipe into the outlet of the nasal duct at the extremity of the nose, I can without difficulty force a current of air or water through the nasal duct; and it therefore appears reasonable to admit that the effect observed by the two gentlemen alluded to, arose from the animal forcing the air into the nostrils while the nose and mouth were immersed in water. Even in the human subject air may be forced up the nasal duct into the lacrymal sac by filling the cavities of the nose from the lungs while the nostrils are closed by the hand.

Persons following up this investigation should be aware that these cavities exist in a very imperfect state in many species, being, in fact, merely rudimental, and incapable of affording the secretion which they are destined to provide in others. The last traces of the organ may even be detected in goats, sheep, and perhaps all the ruminants. It is a beautiful example of that adherence to an original type or model which is so conspicuous in animal organization, and as if in obedience to a law that all the ruminants should be provided with a sinus beneath the eye for the secretion of a peculiar odoriferous matter, but that it should remain in an imperfect or unfinished state in those

who do not require such additional aid to distinguish sex or recognize species.*

Since the above was written I have had an opportunity of examining these sinuses in the wapiti, (*Cervus Canadensis*), and obtained from one of the cavities a large solid mass of the indurated secretion like that found in the sinuses of the stag by Daubenton, and called by him *bezoard de cerf*. This, Dr. Geoghegan, the Professor of Medical Jurisprudence in the Royal College of Surgeons, has been kind enough to submit to analysis, the results of which corroborate the inference that the secretion found in the cavities is derived from the cavity itself, and not from the surface of the eye. The existence of the hairs and flakes of exfoliated cuticle in layers proves that the deposit is formed from the surface beneath, and not by evaporation of fluids trickling into the cavity. Dr. Geoghegan's account of the analysis I annex in his own words.

" The bezoard described by Dr. Jacob is covered by a fine transparent membrane, a good deal resembling gold-beater's leaf; within this, and arranged concentrically, are four or five laminæ, having a coriaceous appearance; these seem to be soaked with the dark-brown matter which constitutes the great bulk of the mass. The thickness of these membranous coverings is altogether about a line and half. The matter contained within this covering is of a dark-reddish brown colour, resembling indurated cerumen, and consisting apparently of a number of fine hairs matted together by a substance of an oleo-resinous appearance. This substance in one specimen was viscid and tenacious, and of the consistence of common turpentine; while in another it was more friable. Both exhaled a most peculiar

* The authorities quoted are Buffon in the original quarto edition, T. vi. and Suppl. T. iii.; Pallas, *Spicilegia Zoologica*; White's *Natural History of Selburne*; the supplementary volume of Griffith's Translation of Cuvier on the *Ruminants*, by Major Charles Hamilton Smith; and Camper, *Œuvres*, T. i.

odour resembling soft soap made with fish oil, but slightly pungent and aromatic. The more friable specimen had the smell of kreosote when much diluted. The specific gravity of the large mass was 1,081. The material has a slightly bitter taste, but does not dissolve in the mouth, and imparts a very slight greasy stain to paper. When heated it swells, grows darker in colour, and undergoes a partial fusion; and if the heat be increased it takes fire, and burns with a bright flame and much smoke, leaving behind a greyish white ash. A fragment digested with five successive portions of water, imparted to them the peculiar odour of the substance, which was however dissipated by evaporation. It appears therefore to contain a volatile odorous principle, which is so intimately combined with the other principles present, that even after digestion in the above-mentioned number of waters, the residuum, which was but little acted on, possessed its peculiar odour nearly as strongly as before. The aqueous solution afforded on evaporation a brownish extractive matter, with which nitrate of silver gave a copious precipitate of chloride of silver; and oxalate of ammonia indicated a salt of lime, most probably lactate. Another portion digested in æther coloured it yellow, and the solution on evaporation furnished a yellowish brown transparent substance, very viscid and tenacious at ordinary temperatures, very readily fusible, and exceedingly soluble in caustic potash; immediately on uniting with which, it exhales strongly the smell of fish-oil soap. This solution is miscible with water without decomposition; acids precipitate a white matter, and when, subsequent to the addition of acid, the mixture is heated, an oily-looking matter floats, and the rest of the fluid becomes turbid and milky. Cold alcohol digested on another portion took up a good deal of yellow viscid matter; and when evaporated furnished also some extractive, soluble in water, probably the same as that afforded by the aqueous solutions. Boiling alcohol, digested on the residuum, takes up more of the yellow matter, which, on evaporation, affords a more resinous-looking residuum,

the surface of which is covered with a greasy film, also saponifiable by caustic potash. Alcohol, digested on what remained after the action of æther, dissolved only a trace of saline matter ; and the residuum, after exhaustion by æther, had the appearance of thin flakes of pearly cuticle, coloured yellowish brown, insoluble in strong acetic acid, but soluble in potash, from which it was precipitated by acetic acid. A portion of these flakes, when strongly heated, left a white ash, consisting of carbonate and phosphate of lime, carbonate of soda, and chloride of sodium. The material then appears to consist of a number of hairs, with a quantity of delicate, cuticular flakes, the whole intimately mixed with a dark matter, composed as follows: a brownish, viscid, oily substance, probably containing resin ; a volatile odorous principle; extractive, soluble in water, and alcohol; colouring matter, which adheres to the flakes of cuticle; lactates of soda and lime, a trace of phosphate of lime, and chloride of sodium in considerable quantity."

ART. XVI.—*Cases of Malignant Diphtheritis.* By EDWARD BEWLEY, Licentiate of the Royal College of Surgeons in Ireland.

CASE I.—Fanny, eldest daughter of the Rev. J. P. H. of C—, King's County, aged 5 years, had been for more than a month in a delicate state of health, owing to derangement of the digestive organs. On the 29th of June, 1835, she accompanied her mother to the residence of a relation, distant from her own home eleven miles, where the children of the family were recovering from severe colds, stated to have been attended by sore throat, but not of so bad a character as to render medical assistance necessary.

July 1st. This morning she complained of some soreness in the throat, but immediately forgot it. Her appetite, however,

became bad, and during this day and the next she seemed not well, though no cause could be assigned for her illness.

3rd. She was brought home in an open carriage, and on the way was exposed to a heavy shower of rain. She was inadvertently allowed to remain for two hours in wet shoes and stockings. In the night she was seized with irregular fever, sometimes burning hot, and again quite cool. She got some purgative medicine, which acted powerfully.

4th. The parents, unable to ascertain the cause of the fever, sent for me early this morning. I found her with the skin hot and dry; countenance flushed; eyes suffused; tongue white and clammy; pulse 130, full, and soft; no headach; no pain any where. Suspecting, from some peculiarity in the voice that the throat was engaged, I inquired if she felt any uneasiness there, but was answered in the negative. Compression with the finger and thumb over the tonsils produced no pain. Still not satisfied, I looked into the throat, and was astonished to perceive its state. The tonsils, uvula, soft palate, and back of the pharynx, appeared in a state of high inflammation, of a fiery-red colour; tonsils and uvula were also much swollen. From the character of the pulse I was unwilling to bleed, or apply leeches externally. Two grains of tartar emetic were dissolved in four ounces of water, and a table-spoonful given every ten minutes till the whole was taken, with a view to excite vomiting. No effect, however, was produced on the stomach till she was immersed to the hips in a warm bath, and had taken large draughts of warm water. Still the stomach was only slightly affected.

R. Calomel.

Pulv. Jacobi, $\frac{1}{2}$ gr. i.

Pulv. Ipecac. gr. ss. M.

Ft. Pulvis, quartis horis sumendus.

Returned home in order to procure nitrate of silver, and in six hours saw her again. A great alteration had taken place in the throat. The back of the pharynx and left tonsil were still more

swollen, and coated with lymph. No pain, even in swallowing. The tartar emetic had produced copious evacuations from the bowels, consisting of a brownish, watery fluid, in which a small quantity of flaky matter was suspended. The symptoms in other respects were the same as in the morning.

Brushed the whole of the fauces with a solution of the Nitrate of Silver, twenty grains to the ounce. Continue the Powders.

Remained in the house all night.

5th. (6, A. M.) Passed a restless night, with continual moaning, and tossing in the bed. Pulse rather more firm than yesterday, but still, although quick, not so strong a pulse as one would expect with so much inflammation and fever. On inspecting the fauces, I found that the lymph had extended, and now covered the right tonsil, uvula, and great part of the soft palate, so as apparently to block up the whole of the passage. Still no pain; no obstruction to respiration; and deglutition performed with considerable ease.

Appr. Solut. Argent. Nit. Omittr. Pulv. Jacobi et Ipecac. Contr. Calomel. gr. i. tertiiis horis.

Being unable to gargle, she was desired to inhale frequently the vapour of hot vinegar and water. The bowels being confined, she had some castor oil.

6, P. M. Castor oil was repeated twice before any evacuation was procured. Stools of same brownish, watery matter, without bile. Throat in same state internally; lymphatic glands at right side of neck enlarged externally. Had several paroxysms of sneezing in the course of the day, followed by profuse discharge of viscid mucus from the nose.

Centr. remedia. Pediluvium.

6th. Lymph increased in thickness. Uvula, with its coating, appears as large as the top of a man's thumb. Pulse 120, soft and compressible; skin moist and natural. Other symptoms same as yesterday.

Omit Calomel. Continue the application of Nitrates of Silver, and inhalation of vapour of vinegar. Poultice to external tumour.

7th. All the symptoms much worse. Discharge from nostrils more profuse; extremities cold; pulse weak and compressible, and yet no considerable prostration of strength, as she is able to sit up in bed without assistance for several hours at a time, and apparently with great ease. Very offensive smell from throat. The lymph, which previously appeared to adhere firmly round the edges, now seems inclined to separate. Alvine discharges of same character.

Contr. Argent. Nitrat. &c. Mouth to be frequently washed with a solution of Chloride of Lime. Warm flannel to extremities.

8th. Offensive odour from throat still continues. Pulse somewhat stronger. Tendency to coma, even when propped up in bed. An inconsiderable quantity of lymph had come away, but on inspecting throat it could not be perceived from what part it had come. Muscular strength still very considerable. Deglutition performed with more difficulty, but without the least pain. In consultation with my friend Dr. Molloy, it was supposed that the offensive smell proceeded from putrefaction of the lymph; and as the external swelling of the glands was increasing, it was resolved to apply three leeches to each side of the neck.

Continr. *remedia altera*.

9th. Leeches were applied yesterday, but did not bleed much. The drowsiness disappeared shortly afterwards, and she seemed much livelier for some time, which considerably abated the fears of her parents. This morning a portion of lymph was detached from the left tonsil, the surface of which being now uncovered, presents a livid, sloughy appearance. Lymph on uvula is partially detached; tongue cleaning round the edges, but middle coated with a brown fur. The other symptoms same as yesterday.

Contr. Argent. Nitrat. et Inhalat. Chicken broth in small quantities during the day.

10th and 11th. Symptoms and treatment pretty much the same as on the 9th. Small patches of lymph came away from time to time, underneath which the mucous membrane appeared in a state of gangrene. The chicken broth was increased in quantity, and the yolk of an egg allowed twice a day.

12th. An attempt at reaction appears to have taken place. Pulse has much more tone; countenance more lively and natural; muscular strength still scarcely diminished. Some bile in the stools, which are of a more natural character and consistency.

13th. A great change for the worse. For the first time the strength appears evidently to decline. In the course of the day she had another attack of the tendency to coma, which, like that on the 8th, totally disappeared in a few hours.

The nutriment was continued, and, in addition, a tea-spoonful of Madeira was given every second hour.

In the evening a slight intermission in the pulse was observable. The voice was much altered, (in popular language she spoke through the nose), so that she could be understood with difficulty, in consequence of which, and her mother having showed me a small piece of lymph which had been expectorated, with a slight speck of blood on it, I examined the throat, and beheld, indeed, a frightful spectacle. The lymph had nearly all disappeared, and the whole pharynx seemed involved in one slough. The uvula and part of the soft palate was completely gone, and on her attempting to swallow some fluid, part returned through the nose.

The wine, &c. were continued through the night.

14th. Evidently sinking. Pulse exceedingly feeble, and intermitting; skin dry and cool; tongue and gums coated with brown sordes. In addition to the wine and broth, the following mixture was prescribed as a stimulant:

R. Tinct. Opii 3ss.

Sp. Ammon. Aromat. 3iiss. M.

Sumat. gutt. vi. singulis horis.

These means were persevered in during the day and night.

15th. At four o'clock this morning she died, retaining her intellects perfect to the last. The urine was suppressed for twenty-four hours before death.

CASE II.—Mary Jane H—, aged 3½ years, sister to the subject of the last case, had always been an extremely healthy, robust child. Immediately on the discovery of the disease in Fanny's throat, I caused Mary Jane, and a younger child, aged two years, to be removed to another house. Whilst there, the youngest contracted a slight sore throat, probably from teething; and her parents, supposing her to be affected with the same disease as her eldest sister, unfortunately brought both children home, under the idea that Mary Jane was equally exposed to contagion in either place.

On the 19th July she was in perfect health and spirits, and went to bed as well as ever. In the night she awoke with nightmare, and again fell asleep.

20th. At 9 o'clock this morning she awoke with burning skin and quick pulse, but made no complaint. Her mother gave her a mixture of senna and salts twice, which freed her bowels well, but produced no diminution of the fever. The stools were perfectly natural in appearance. Several times during the night of the 20th she awoke with convulsive twitchings of the head and arms, complaining of acute pains in the latter. These attacks continued about a minute each time, the body remaining rigid and stiff.

21st. I saw her this day, and found that she had arisen perfectly free from fever; pulse 90; skin cool and natural; tongue clean; spirits good; but she was rather pallid, and with little or no appetite. I ordered no medicine, as the purgative which she took yesterday had not long ceased to operate. I examined

the throat most carefully and minutely, but the mucous membrane was quite pale, and looked perfectly natural.

22nd. This morning I had a note from her father, mentioning that he had discovered the cause of the fever on the 20th in a *boil* which had appeared on her back, and that he had given her some medicine for it. In the course of the day fever again made its appearance; the medicine given in the morning acted on the bowels, but the discharges, instead of being natural, as on the 20th, presented the same appearance as those which accompanied the disease of her sister, viz. a brownish water, containing some white flakes, and apparently without bile. In the evening I heard that her father had discovered that the throat was inflamed, and a patch of lymph on the left tonsil. I lost no time in visiting her, and found the throat as it was described; skin hot and dry; pulse 108, exceedingly weak and compressible; countenance indicative of anxiety and languor; no pain or difficulty of swallowing; no headache; tongue a little whitish. I immediately brushed the fauces with a solution of nitrate of silver, thirty grains to the ounce, which was repeated every third hour, and directed a table-spoonful of chicken broth to be given every second hour during the night.

23rd. (4, A. M.) The lymph has come away from the left tonsil, leaving the mucous membrane perfectly clean; but a small patch has made its appearance on the right tonsil, and the whole fauces are rather more swollen than last night; pulse 120, with rather more tone than when she commenced the broth. I left my patient to the care of Dr. Molloy, and set off for Dublin to consult Dr. Graves, whom I saw at 5, P. M.; and as soon as possible after receiving his advice returned home.

24th. (A. M.) Disease progresses. Left tonsil again partially covered with lymph, as are also right tonsil, uvula, and back of the pharynx. Pulse same as yesterday; skin of natural heat, and *moist*; tongue very much furred. The broth was regularly persisted in during my absence, and the bowels freed by castor oil.

Contr. Argent. Nitrat. 6tis horis. Contr. Juscum. Applr. Vesicat. nuchæ. Sumat Liquor. Chlorid. Soda gutt. iv. 4tis horis. Ha-beat Enema ex Sulph. Quininæ gr. ii. cum Amylo bis quotidie.

10, p. m. Throat, pulse, and tongue in same state. Blister rose well. The first enema was retained; the second rejected almost immediately. Is sleeping quietly at present.

Wash throat with Chloride of Soda.

25th. (4, a. m.) Lymph over the whole fauces has increased in thickness; pulse 120, rather improved; tongue coated with brownish fur; sneezed twice or thrice, and had slight mucous discharge from the nose; speaks *thick* for the first time.

Contr. remedia ut heri.

As the enema containing quinine could not be retained, I substituted one grain three times a day by the mouth in lieu of it.

5, p. m. Discharge from nostrils has ceased; tongue very moist, and cleaning round the edges; constant trickling of limpid fluid from the mouth; slept quietly about two hours during the day; skin soft and moist.

Beef tea.

11, p. m. There has been a slight discharge from the nostrils once or twice since last report, but it has again ceased. On attempting to drink, part of the liquid was coughed up through the nose. Pulse and tongue as in the morning. Bowels have not been relieved for twenty-four hours; abdomen rather full; urine scanty.

Repetr. Chlor. Soda fauibus. Habt. Enema laxat. Contr. Juscum bovinum, &c.

26th. Had rather a restless night; enema operated well; stool natural; sonorous, gurgling respiration, as if from mucus in the nose, and increased discharge from nostrils; countenance puffed and swollen; eyes dull and heavy. Lymph, as far as can be ascertained by inspection of the throat, has not extended;

however, the speech would indicate that the nose is more engaged.

Contr. remedia.

5, P. M. No amendment since last report; on the contrary, she seems rather worse. Increased discharge from nose, and more gurgling and sonorous respiration. Pulse 120, more compressible.

Throat was brushed with a mixture of one part strong muriatic acid, and three parts honey.

Midnight.—No alteration in local symptoms; general appearance improved; face less swollen; eye more lively; tongue cleaning, and very moist. Expresses some desire for food; has taken beef-tea several times to-day. Is covered with warm perspiration. Pulse 120, somewhat firmer.

27th. (7, A. M.) Has had a restless night, with tossing of limbs, and little or no sleep; respiration louder, and appears more difficult than before, interrupted by occasional *sobs*; pulse 120, feeble; abdomen full, but soft; no stool since yesterday morning; discharge from nose occasionally profuse, and at other times suppressed; tongue still very moist; trickling of mucous fluid from mouth.

Habt. Enema laxat. Contr. remedia altera. Sulph. Quininæ, gr. iss. quater in die.

7, P. M. Enema operated well; stool natural; appeared considerably livelier after it, and continued so for several hours. Is now very languid and dull. No discharge from nostrils; skin soft and moist; no alteration in local appearances. Has taken a large wine-glassful either of strong beef-tea or jelly every fourth hour. Abdomen still rather tumid.

Reptr. Enema.

Midnight.—Had a good natural stool from the enema. Is now asleep. Interrupted, irregular respiration, though less loud than hitherto; considerable gurgling in the throat; pulse a little stronger than at last report.

28th. (7, A. M.) Some sign of muscular debility for the first time ; pulse 120, more and more compressible ; voice much weaker, but not hoarse ; great appearance of languor ; bled from the nose about a drachm ; no mucous discharge from nostrils since yesterday morning ; mouth and tongue still very moist, but of a very dark colour, perhaps owing to some blood having got into the mouth. Lymph in the throat appears more flocculent, and a small piece came away ; abdomen full and soft.

Repetr. Enema. Broth and jelly every third hour. Contr. Quinine et Chlor. Soda. Two tea-spoonfuls of Madeira twice a day.

Noon.—Two natural stools from enema ; urine in tolerable quantity, a little higher coloured than usual ; skin cool.

6, P. M. Better in every respect ; pulse more firm ; countenance more lively. At one o'clock nose bled again.

11, P. M. Constitutional symptoms still continue more favourable, but since last report voice has become very hoarse, with a peculiar croupy sound, chiefly remarkable during a sudden inspiration as in crying. Inhaling the vapour of vinegar and water appears to relieve the symptom for the time. During sleep she breathes quietly.

29th. (7, A. M.) Slept well last night, and appears better this morning, were it not for the hoarseness and croupy cough which continue. She used the inhaler twice in the night.

Contr. remedia. Enema laxat.

6, P. M. Enema produced a tolerable motion ; croupy symptoms have been gradually increasing during the day ; voice more and more hoarse ; cough more frequent ; inclination to drowsiness and somnolency ; countenance dull ; eye heavy ; had slight epistaxis twice in the day. Nevertheless, the pulse and muscular strength are improved ; no discharge from nostrils ; respiration during sleep less distressing ; abdomen full, and rather tympanitic.

Enema Cathart. Sumet Calomel. gr. ss. singulis horis.

11 p. m. Enema operated inefficiently, and two drachms of castor oil were given, which has affected the bowels. Symptoms same as at last report.

30th. (8, A. M.) Slept soundly and quietly the whole night, except when awakened to take medicine or nutriment. Calomel was continued during the night till seven this morning. Croupy symptoms still continue, but are not urgent. The cough recurs at long intervals, and there is no difficulty of respiration; voice almost extinct; strength sinking rapidly; pulse very weak and thready, but regular; no offensive odour from throat. Calomel seems inclined to run off by the bowels.

Omit Calomel for two hours. Continue nutriment. Wine and Water occasionally.

3, P. M. The calomel was again resumed at ten o'clock in doses of a quarter of a grain every half hour, with a drop of tinct. opii with every second dose to prevent purging. Mercurial ointment was also directed to be rubbed on the neck and arms.

Nutriment, Wine, and Quinine to be persisted in.

10, P. M. The above remedies have been strictly adhered to, but without any beneficial effect. Pulse has again rallied, and the strength returned, so much so, that the patient is able to sit up, or even stand in her bed; but the affection of the larynx continues steadily to increase. Respiration sibilant; cough more frequent; and voice hardly perceptible. Lies supine, in a state of stupor. Mercury has produced no sensible effect, but has not acted on bowels since combined with opium.

Contr. Calomel. gr. ss. sing. horis, *sine* Tinct. Opii, et Ung. Hydrarg. Cum cæteris remediis.

31st. (6, A. M.) Continued to take the calomel up to three o'clock this morning, when it was suspended, owing to the jaws having become swollen, the pulse getting more feeble, and the extremities cold. At this hour the pulse has regained its former strength, but there is no appearance of any diminution of the

disease in the larynx. Respiration is becoming more difficult; cough more shrill. She lies in a state of insensibility, from which she is roused with difficulty. Refuses nourishment, and if compelled to take it, swallows with a very painful effort, and by very small quantities at a time. Skin moist; feet warm.

From this time she continued rapidly to grow worse; the respiration became more and more difficult; the countenance flushed, and afterwards livid, and the pulse intermitting, and scarcely perceptible. At eight o'clock in the evening death closed the scene, for some time previous to which she struggled violently, as if gasping for breath.

CASE III.—I am not able to afford more than a general outline of the progress and treatment of the following case, as owing to other professional engagements at the time, I was not the person in constant attendance on the child, but merely visited her occasionally in consultation with two other medical men, who had the charge of the case.

Louisa H.—, aged 2 years, had been from birth a puny, delicate child. She had been exposed to precisely the same risk of contagion as her sister Mary Jane, (the subject of the preceding case), and yet the disease did not appear in *her* throat till the 10th of September, when it was accidentally discovered. She had been removed from home at the time the disease appeared in Mary Jane, and had never been in the house where she died afterwards. The premonitory symptoms were pretty nearly the same as in the two former cases, namely, a slight febrile attack two days before the appearance of the lymph, which lasted about twelve hours, and then disappeared, leaving the child apparently as well as before. This feverish attack was attributed partly to teething, and partly as the consequence of an eruption which had been on the little patient's head and left ear for more than two months, but latterly had become more inflamed and irritable.

I saw her on the night of the 10th September, and found that previously to my arrival the physician in attendance, Dr. F.,

had applied a blister from ear to ear. There was a small patch of lymph, not larger than a split pea, on the left tonsil, and the rest of the fauces were of a bright red colour. The next morning (11th) the lymph had extended over part of the back of the pharynx, but not in any considerable degree. The constitutional symptoms were the same as in the preceding cases: extreme weakness and compressibility of the pulse, but no corresponding muscular debility; countenance more than usually pallid; appetite and digestion almost unimpaired, and slept as well as usual.

On the 12th Mr. Jameson of York-street, Dublin, arrived at the house, and remained with her constantly till her death. Previously to his arrival, and without my knowledge, Dr. F. had dressed the blistered surface with tartar emetic ointment! Mr. Jameson's plan of treatment was afterwards rigidly adhered to, viz. the throat was rubbed twice a day with a stick of nitrate of silver; two grains of calomel were given every second hour till upwards of eighty grains had been taken; and with a view to get the constitution more rapidly under the influence of mercury, an ounce of mercurial ointment was rubbed into the legs and arms. Tonics and stimulants in large quantities were also administered; strong beef-tea almost every hour; from ten to sixteen grains of quinine, and four ounces of brandy in the twenty-four hours. Notwithstanding, the mercury produced little or no effect. The gums were scarcely affected, and there was a very faint mercurial foetor of the breath. The disease in the throat, meanwhile, which had not at any time been of much extent, began evidently to diminish. The quinine and brandy seemed to produce literally no effect whatever. On the 15th the blistered surface was discovered to be in a state of gangrene. It was dressed with various stimulating applications, but without any beneficial result. The pulse continued to grow more and more feeble, but the muscular strength did not decline in the same ratio, as she was able to run about the room the day of her death, which took place on the 18th.

There was a post-mortem examination, at which I regret I was unable to be present. I understand the lymph had entirely disappeared from the throat, which seemed in a perfectly healthy state.

I have been, perhaps, tediously minute in my history of these cases, but I hope not unnecessarily so. The disease, though exceedingly rare in the country, is of great importance on account of its deadly nature, and, I am convinced, is not as yet sufficiently understood by the profession. As far as I know there is no English work which gives any adequate account either of the symptoms or the appropriate treatment. Some French authors, Bretonneau, Guersent, &c. appear to have devoted considerable attention to the subject. The latter, in the "Dictionnaire de Medecine," has given a beautifully minute pathological description of the disease, which he terms "*Angine comenneuse asthenique*," but has totally overlooked the constitutional symptoms, especially those of a premonitory nature; and his hints as to treatment are excessively meagre and unsatisfactory. For these reasons I have given the above cases (particularly the two first) at such length, as it is only by possessing an accurate knowledge of all the symptoms in every stage of the disease that the practitioner can hope to ascertain the most appropriate treatment.

On a careful perusal of the above cases, there are several circumstances, which will appear worthy of remark.

1st. The extreme insidiousness of the disease at the commencement. In fact, at first there was scarcely any thing which could induce a suspicion that the throat was affected at all. The patients complained of no pain or uneasiness in the throat, or difficulty of swallowing. They had a slight feverish attack for about twelve hours, which had totally disappeared for two days before the accession of inflammation or appearance of lymph.

2nd. The extraordinary nature of the pulse as compared with the muscular strength. In all the cases, from the very beginning, the pulse was as weak and compressible as if the patients were in the last stage of typhus fever ; while the muscular strength held up almost unimpaired till within a day or two of death.

3rd. The nature of the alvine discharges at the commencement of the attack, which I have described as being a brownish water, containing some white flakes, and *without bile*.

4th. Taking into account the short time which intervened between the accession of the disease and death, we might expect that the constitutional disturbance would have been much more considerable than it was. Except in the second case, where the disease had evidently extended to the larynx, there was nothing in the constitutional symptoms which would indicate that the patients were in such extreme danger. The sensorial functions were wholly unaffected ; the patients slept soundly and quietly ; the appetite was tolerably good, and the digestion well performed. During the greater part of each day, the children seemed as lively and cheerful as ever, sitting up in bed, and playing with their toys. The youngest child was not confined to bed at all, but was actually running about the room the day of her death.

5th. The tonic and stimulant plan of treatment is generally considered the most applicable to this disease, and certainly the condition of the pulse would seem to indicate no other. But how are we to reconcile this with the fact that the eldest child, who had been previously in ill health, and who had been treated in the beginning rather antiphlogistically, lived two days longer than the second, who was always a stout, healthy child, and three days longer than the third, although the two last were treated on the stimulant plan from the commencement of the disease.

6th. *Gangrene* is considered a very rare termination of this disease. Bretonneau denies that it ever takes place. This I

am enabled to contradict from the first case, in which the uvula and part of the velum palate sloughed away.

7th. It may not be uninteresting to notice the evident infectious nature of the complaint. There is no way in which I can account for its communication to the two younger children, except by contagion. The disease was not epidemic at the time, nor has there been another case in the neighbourhood since.

The above remarks I throw out for the consideration of my medical brethren. I do not presume to say what is the best plan of treatment, but I am rather inclined to think that the active use of mercury from the very outset offers the fairest chance of success. The experience of case three proves, at all events, that it may be tried with perfect safety.

ART. XVII.—*Observations on diffuse Cellular Inflammation, with some Remarks on Contagion.* By CHARLES LENDRICK, M. D., T. C. D., King's Professor of the Practice of Medicine in the School of Physic, one of the Clinical Physicians of Sir Patrick Dun's Hospital, Physician to Mercer's Hospital, &c.

IN considering this and other diseases affecting the *cellular tissue*, whether external, or as it exists as the internal bond of union, sufficient consideration has not been afforded to its *vital* properties, a reference to which might often diminish the difficulties connected with the phenomena. The cellular tissue is, in the words of Meckel, "the coagulable fluid in a state of coagulation;" the subsequent state of that, which originally constituted the elements of the foetus; and the frame-work by which the different viscera were formed. It would be extremely unphilosophical to conclude, that properties so marked as these, and vested in a particular tissue, should cease on the human being attaining maturity; and we are not to conclude that parts of little

apparent sensibility in their healthy state, do not possess a powerful excitability during disease, when the dormant vitality is roused into action.

I make these remarks, because it is but too much the custom to consider the cellular tissue, although obviously the very site of disorganization, as one of quite secondary importance, and to view its changes as merely chemical or mechanical. The very prevalent and very fatal disease to which I am now alluding, has brought us to form more correct opinions on the subject.

In particular states of the atmosphere, and in particular states of individual constitution, the cellular tissue is liable to be attacked by a very general and diffused form of inflammation, which in a great proportion of cases proves fatal. The first, or its epidemic character, is proved by its prevalence in certain districts at particular times ; thus, it existed in the form of the Plymouth dockyard disease, at Edinburgh, and frequently (for instance last winter) in our own metropolis. The second, or its dependence on a temporary susceptibility of the individual, is shown as in other cases of disease, by particular persons falling victims to its influence, whilst others are exposed with impunity to similar exciting causes. What this particular state of the constitution is, is as difficult to determine as the cause and *modus operandi* of the atmospheric influence ; but mental anxiety or depression—the ravages of intemperance on the constitution—those of previous disease—too close an application to study or other mental exertion—and exposure to an unwholesome atmosphere, such as that of the dissecting-room, the anatomical museum, or the hospital—exercise always a most deleterious influence both in establishing the disease, and in leading to its fatal termination.

When the two causes above alluded to are in effectual operation, almost any injury, however slight, may be sufficient to prove an *exciting cause* ; a scratch, a cut, or a puncture, even with a perfectly clean and sharp instrument, or the common

operation of venesection, however skilfully performed, may be sufficient to induce it ; nay, it may occur *spontaneously* ; and these circumstances have induced some to conclude, rather hastily, that it is entirely dependent on constitutional idiosyncrasy, and to overlook altogether its *contagious* origin. Although where the predisposition is strong, such slight causes as I have described may suffice for its production, yet, if the injury be one, which under ordinary circumstances would be likely to produce a *fester*ing sore, instead of one healing in the common way, the occurrence of fatal diffuse inflammation will be more probable. Thus a few boils or anthraces, which at another time would yield to simple treatment, may extend their effects throughout the cellular tissue, and even generate visceral disease, as (as far as I can judge from the accounts) probably happened in the case of a late lamented nobleman. The inoculation with the vaccine virus, after the scabbing process had taken place in the vesicle, has also been known to produce a similar result. In short, almost any seed will ripen when the soil is fruitful.

The disease, however caused, is undoubtedly highly contagious in the strictest sense of the word ; and an abraded pimple on the skin of an individual apparently healthy, and not peculiarly susceptible of the disease, and still more probably that of a person thus predisposed, if brought into contact with the skin of the patient, or of any of the fluids exuding from it, will prove the means of implicating a second victim.* Even cases have been recorded where the infection has been propagated by mere contact with the parts principally affected, and where no abrasion could be detected in the skin of the sufferer ; although it is not improbable that such existed, and escaped notice at the time. Of course it will be said in opposition to the contagion of this and other diseases, that many persons exposed to

* See the cases of Messrs. Newby, Rainer, Blythe, Young, and those of the lady and her nurse, mentioned by Travers.—*Constitutional Irritation*.

its influence escape without detriment, and this is undoubtedly true; and the same takes place in the plague, the small-pox, and many others of an unquestioned contagious character. Non-susceptibility is as frequently and as powerfully demonstrated in the human constitution as susceptibility, these being the names which we assign to an undoubted effect, whose cause we are utterly ignorant of. Much of our perplexity arises, however, from neglecting the consideration, that diseases are of Providential infliction, and that although human beings are occasionally used as the means of propagating them to *one another*, there may be *other modes* of extending them:

I have frequently been in the habit of illustrating to my pupils, the fallacy of denying the connexion between cause and effect on account of individual exceptions, by adducing one instance where that connexion is universally conceded, and yet, where it occurs is by far the *minority* of instances: I allude to the production of tetanus from an external injury. No one denies that the tetanic affection has been the effect of the injury, although he is aware that hundreds suffer similar injuries without any such result. Here the undoubted necessity for what we call susceptibility, by no means impugns the adequacy of the cause to produce the effect, and for a similar reason *one well attested* instance of contagion should be sufficient to establish the contagious nature of a disease, even though there were many instances in which the malady, under similar circumstances, was not propagated.

In this matter we may much diminish the difficulties connected with the consideration of the infectious nature of cholera, fever, and many other diseases. Some are doubtless not infectious at all; others are extended by intercourse with the affected in such few instances, that it is but rarely apprehended; as in the case of phthisis, and also epilepsy, where the *occasional* propagation is as certain, as the *occasional connexion* between an external injury and the occurrence of tetanus.

Among infectious or contagious diseases, usually so called, there is every imaginable grade, as to frequency of production in a given number of instances, and thus we are justified in prefixing the terms *more or less*. Phthisis and epilepsy are barely entitled to the name; cholera is not propagated thus in probably the majority of instances; and yet there are few diseases whose occasionally virulent contagious character can be more decidedly demonstrated. The contagious nature of eruptive and other forms of fever is too well known to require to be dwelt on: and none are more capable of being extended by contact or inoculation, than diffuse inflammation of the cellular tissue.

Both this diffuse inflammation and cholera differ, however, from fever, as to the nature of their contagious influence, in a very important particular. The contagion of fever seems to become extinct with life; no instance has occurred, I believe, in this city, of it having been contracted by dissection, although for many years the subjects were supplied to the anatomical schools from the fever hospitals. I have certainly known, however, of small-pox being propagated this way. As to cholera, the instances are numerous, and among the rest, my lamented predecessor in the professorship of the Practice of Medicine, Dr. Leaby, contracted cholera at the moment of placing the body of his friend, Dr. Bell of Sligo, in the coffin; both died of the disease within a few hours.

The contagion of diffuse cellular inflammation, although otherwise propagated, resembles that of cholera in not being extinguished but rather increased on dissolution taking place. The bodies of patients who have died of disease of that character, seem also to acquire a similar property. Thus gangrenous erysipelas, urinary infiltration, in short any extensive cellular disease, also inflammatory affections of a structure, which all physiologists admit to be identical with the cellular, the serous pleurisy, peritonitis, &c. will, if the fluids of the affected parts be introduced by the scratch of a knife, a needle, or a spicula of bone, or even through the means of a wound or

excoriation previously* inflicted, be sufficient to engender diffuse inflammation.

It is difficult to determine, whether the serous cavities possess this infecting property during ordinary inflammation, or whether it is acquired only in the severer forms which prove fatal; or finally, whether it is established or at least much increased on death taking place. The latter would seem the most probable on the entire, at the same time that our opportunities of observation are rare, as but few occasions occur of bringing the wounded hand of an operator in contact with living serous texture in the state of inflammation.

Dear-bought experience has, however, made us fully aware, that there is peculiar peril in a dissecting wound received from the body of a person who has died in consequence of any of the cellular or serous diseases I have mentioned; nearly as much so, indeed, as if the diffused cellular disease itself had existed in the deceased.† This danger seems to be greatest during the period immediately succeeding death, while the body is yet warm, and is supposed to diminish gradually by time, and to become nearly extinct on putrefaction taking place. I have accordingly been in the practice of informing my class, that diffuse inflammation takes place under two circumstances. The first, where it is generated, on the principle of contagion, from the body of a person who died, either of that disease or a similar affection of the cellular or serous tissue; here the predisposition need not be strong, nor accessory causes very operative. The other, where either from epidemic influence, or

* I have seen a fatal case where the disease was produced by wiping a dissecting table, the fingers having been previously slightly excoriated by an eruptive affection. One of the medical students last session contracted it by means of what is called a "false nail."

† Perhaps in these cases there is the disposition to diffuse cellular inflammation, and which might terminate in its establishment were life protracted. The serous inflammation being its first, instead of, as is usually the case, the last stage.

temporary idiosyncracy, or both, the predisposition to diffuse inflammation is great and readily excited; when any cause of local irritation, which at another time would terminate in a slight suppurative affection, will be sufficient to produce this, of such great malignity and fatality.

A very general inquiry, when a patient has received a dissecting wound, is, as to the existence of symptoms indicating inflammation in the course of the absorbents, abscess in the axilla, &c. Information on this subject is no doubt desirable, but as to its determining in a positive sense the existence of diffuse inflammation, it is of no value whatever; these symptoms no doubt indicate an *extension* of inflammatory action from the site of injury, and frequently arise from dissection, but they are not deserving of the name of diffuse inflammation. So far from such symptoms characterising that disease, I do not recollect one *fatal* case where inflammation of the lymphatics and abscess in the axilla took place; on the contrary, it may I think be laid down as a rule, that the danger is always great in proportion to the *want* of obvious connexion between the *primary* inflammation and the site of injury. The first symptoms of cellular inflammation often take place at a *remote* part, and sometimes a proximate local affection either does not take place *at first* at all, or quickly subsides if it do, and the patient seems to labour under typhus fever, *with something peculiar*; and so well marked is the merely-constitutional character of the disease, that the medical attendant will often overlook the local affection altogether, and suppose the case to be one of idiopathic fever.*

Generally, however, before the fever has made much progress the nature of the case is more clearly developed, and the most frequent symptom is pain, always violent and sometimes nearly intolerable, in the site of the pectoral, trapezius, or latissimus

* These remarks have been made by other authors. I am now, however, detailing in full what I have observed.

dorsi muscles, and which is followed by a greater or less degree of tumefaction, and sometimes by a dusky red discolouration resembling erysipelas. In some cases the skin over the tumefied parts is of its natural colour throughout, and I have seen an instance where this was the case till shortly before death, when it became dusky, tense, rigid, and so exquisitely sensible, that the slightest touch was productive of extreme torture.*

The affection thus displayed along the neck, breast, or back, is more or less developed in the other parts attacked. The small milky vesicles which have attracted so much attention, I have not seen except in the inoculated or contagious cases, and even then they are by no means invariably present. They generally occupy the site I have mentioned, or else the neighbourhood of the injury; for it is one of the most extraordinary circumstances connected with this extraordinary disease, that after having almost made the circuit of the body, it will often secondarily or rather *ultimately* attack the parts immediately adjacent to that through which the virus was *introduced* into the system. I have observed no part more invariably attacked than the *opposite knee*.

The pain in the parts affected is extremely variable; in some cases they are merely what is called *sensitive*, in others the slightest touch produces the most exquisite agony, and occasionally the patient appears almost distracted with local suffering, which is neither augmented considerably by pressure, nor traceable to any obvious cause.

The fever is always of the typhoid, or rather of what is termed the irritative form. There is profound dejection and depression of spirits, and the type of the disease generally re-

* In a case under my care in Mercer's Hospital a few years ago, and which was either idiopathic or produced by a very slight bruise, the skin over each part successively affected assumed the appearance and texture of the surface of toasted ham. It was the most rapidly fatal case I ever witnessed.

sembles the "*fièvre atypique*" of the French; that form to which persons of and above the middle rank, and who have suffered from mental anxiety, are especially liable. That faint characteristic of some forms of typhus fever, a non-agreement of symptoms, that is, an intermixture of the very worst, with others which would denote a state of almost perfect health, is frequently present. The mind, awake and on the watch, is generally collected amid its settled conviction of approaching death, an anticipation too frequently correct, and often accurate even *to the hour*.* Delirium is seldom considerable, and usually occurs at night, or towards the close of existence; but in the case of a medical-student last season, the delirium was incoherent and violent throughout the whole course of the disease.

Death generally occurs from about the ninth to the thirtieth day; but in one case under my care in Sir Patrick Dun's hospital last winter, death took place during the fourth week, after many apparently favourable but delusive changes.

Phlegmon, or acute abscess, is always to be viewed as a favourable occurrence; the disease appears to concentrate itself, and to be expended in the local affection, especially when judiciously treated; but indolent suppuration, or chronic abscess, even though the pus may appear healthy, is by no means to be relied on, particularly if there be any previous pulmonary irritation. It is not necessary that the affection should be such as to admit from the first of detection by stethoscopic analysis; a slight habitual cough will frequently merge into organic thoracic disease during the external suppuration, probably from *metastasis*; and the patient will exhibit before and after death the characteristics of pleurisy, pulmonary suppuration, &c.

* The opposite state sometimes exists, the patient declaring himself "quite well" just before dissolution, and he is frequently silent and contemplative, and impatient of being questioned. In general, however, he is perfectly sensible of his condition and its danger.

As to the *prevention* of this frightful disease, its exciting causes are sometimes so slight, numerous, and in the great majority of cases not followed by any serious result, that precaution is almost impracticable. The surgeon, who may lose his character as well by misfortune as by fault, will do well to avoid every avoidable operation whilst this disease is known to be prevalent, and I advise my pupils to observe this caution even with respect to *venesection* when not altogether indispensable, and then to use dexterously a sharp instrument, and particularly to inculcate absolute rest till the wound is perfectly healed; and I further recommend them to be very cautious in blaming *others* for a misfortune which might happen to themselves, or even to older heads and abler hands.

As to the prevention of the *contagion*,* those in any way indisposed should, especially when it is prevalent, avoid the dissection of persons having died under the circumstances I have described, particularly whilst the body is fresh. As to local preventives, the inefficacy of caustic has been fully demonstrated,† and I am inclined on the entire to prefer (whether the part be sucked or not) washing the wound with a saturated solution of alum and nitre, equal parts, which seems to coagulate the noxious fluids at its surface. This practice has been adopted for years by Dr. Macartney, Professor of Anatomy and Surgery in our University. He keeps several vessels of the solution ready prepared, and directs his pupils to wash themselves when injured, or suspecting that they may be so; and it is remarkable that although diffuse inflammation has been prevalent elsewhere in Dublin, not a single case has occurred in his extensive dissecting establishment, at least where this preventive was had recourse to.

* It has been long observed that persons who live rather well, but not intemperately, escape contagion of every kind better than the abstemious, especially if over studious.

† In the cases of Dr. Pett and others.

When the disease is once established we are to recollect that resolution is out of the question ; that our best chance of recovery is in the establishment of local healthy suppuration ; and that this object must, after all, depend for its attainment on the powers of the constitution. The practitioner must therefore here, as elsewhere, be content to be the handmaid of nature ; to endeavour to husband her resources ; and, above all, to have recourse to no mode of treatment that may, by sinking the powers of life, diminish the few chances that the patient has for his recovery.

I shall briefly notice the treatment under the usual heads—the constitutional and the local.

The fever being typhoid and irritative, the treatment is nearly such as is proper in the idiopathic forms. The violence of local pain, apparently referrible to a viscus, and the general symptoms of excitement, not unfrequently induce the medical attendant to have recourse to the lancet at the commencement of the disease, a practice almost invariably prejudicial, and in some cases as much so as a similar mode of treatment would prove in genuine typhus fever, or delirium tremens. In most cases the symptoms of visceral inflammation are deceptive, and the powers of the constitution are sunk, and its irritability increased by the supposed remedy. No doubt visceral inflammation takes place in some cases, but it is not generally at the very first period, and it usually occurs in those predisposed to organic disease. I am afraid such have but little chance under any mode of treatment, and that they generally present but too fatal a proof of the vital and metastatic properties of the cellular tissue. However should visceral inflammation be unequivocally demonstrated, either by the stethoscope, or an assemblage of symptoms, blood-letting must of course be had recourse to. It should, however, always be to the smallest amount that is likely to answer the purpose, and if this can be effected by local bleeding, instead of venesection, so much the better.

Copious purging is nearly as objectionable as bleeding. It

is indeed one of the errors of British physicians to suppose that the alimentary canal can only be out of order in the *one* way, and that requiring invariably a stimulus by cathartics. It is almost needless to describe the symptoms which denote an accumulation of faecal matter or air in the intestines, or to say that when such takes place, it should be removed by those means with which every practitioner is acquainted. I must however protest against the principle of dosing the patient with relays of calomel and black-bottle for the purpose of "cleaning his tongue," (which, under the circumstances, would be like attempting to wash the Blackamoor white,) or for removing "congestions" that often exist only in the brain of the doctor. Except where the symptoms of accumulation already alluded to take place, it will be best to content ourselves with one, or at most two *moderate* evacuations daily, and which may be procured by preparations of rhubarb, castor oil, and the milder aperients, aided by enemata.

Calomel has been strongly recommended, on the supposition that *if* the mercurial influence could be produced in the constitution, that of the disease would subside, as we know to be the case in other instances. But it is to be recollected that the "healthy" mercurial action, as it is called, is producible with great difficulty in *such* a constitution, and that in the attempt we incur the risk of making matters worse than before. When we find a bad constitution in other cases we generally endeavour to right it first, and exhibit mercury afterwards, but for such a proceeding there is no time here. When I have given calomel with such an object in this disease, I have generally found it to produce those symptoms which usually warn us of the unhealthy action of mercury, and in some cases, although combined with opium, it ran rapidly to the bowels, and would have sunk the patient if continued. There is perhaps a chance that it *may* hit, and have accordingly claims to "kill or cure." By a mode of administration hereafter to be mentioned, the use of mercury is less objectionable, but I should certainly reserve

the attempt for those cases where the *structural* part of the disease is developed more than the constitutional, and where the latter seems to be rather symptomatic of the local affection, than characterized by the usually fatal symptoms of typhus or irritative fever.

The use of stimulus should, especially in the advanced stage, be had recourse to more copiously than in other cases of fever; but this treatment may also be easily overdone, and the latent spark of visceral inflammation be readily excited. The administration of camphor, musk, ammonia, and barm, has been so well described by the fever practitioners of this city, that it is unnecessary to say any thing on the subject; and in no place, perhaps, are wine and the dietary restoratives used with more judgment and discrimination. In this affection however we are warranted in exhibiting them to a farther extent than would be justifiable in common typhus; and if copious suppuration, with sloughing, should take place, the necessity of support by means of wine, malt liquor, beef gravy, &c., as far as the stomach will bear, is altogether obvious.

Sedatives are requisite for a twofold object: 1st, as mitigating pain; and 2dly, as, by producing sleep or tranquillity, preventing the morbid reaction of *the mind* upon itself. The two modes of administration I prefer are by enema, and in the form of acetate of morphine, combined with citrate of ammonia and Hoffman's anodyne liquor. Both these modes possess the advantage of enabling us to *try* the action of opium on the patient's constitution, without producing the irritation usually consequent on an insufficient dose of other preparations. We are thus enabled, by gradually increasing the quantity in divided doses, to determine the precise amount which will be requisite to cause sleep or mitigate pain, without incurring the risk of giving an overdose, which might throw the patient into a state of coma. I have not tried prussic acid in this disease, but from its effects in others, I should augur favourably of its success.

As to the *local* treatment, it is but too much the practice to

have recourse to incisions on the commencement of pain, whether in the injured limb or elsewhere. I have rarely, if ever, seen benefit from the practice, and I have been informed by patients that their sufferings, both local and general, were aggravated by it. Of course if a superficial abscess is formed, or suppuration has taken place, and can be *distinctly* felt, or if there be *proof* that the patient's sufferings are attributable to the parts being girt down by a tense fascia, there can be no doubt as to the propriety of affording relief by incision; but in this disease, in the majority of cases, the excessive pain is not referrible to such a cause, and *speculative* incisions only increase the patient's torture.

The treatment of the parts affected does not indeed materially differ, whether they be in the neighbourhood of the injury or elsewhere. A poultice is generally had recourse to, and often with advantage, but sometimes the pressure of it is intolerable. The *local steam bath* is in such cases a valuable substitute, and I have generally found much relief experienced from the spirit stupe, one part of spirit of wine to three of warm water, the stupe cloth being covered with oiled silk. In some instances, however, warm applications cannot be borne at all, and we must have recourse to the cold; although in one case under my care, the patient required the stupe to be made so hot that I could barely touch it, and in that state he declared it quite *comfortable*. Indeed a great part of the sufferings, both local and general, are referrible, to *deranged* sensations, and our mode of relief must be *tentative* and directed by his feelings; nor are we to fall into the error of supposing that they are of that ordinary character, as to be relieved by the lancet generally, or by the scalpel locally.

One of the best local applications is lint, dipped in a mixture of oil of turpentine and laudanum, and covered with the poultice or stupe cloth. Its stimulating, superadded to its analgesic quality, seem to accelerate suppuration in the part,—an

occurrence also favoured by small blisters* in the vicinity,—and it is remarkable, that the application of leeches appears also to be conducive to the same object ; at any rate they afford relief, and provided they be not had recourse to, to such an extent as to debilitate the patient, their application is always to be recommended.

Of late years friction with mercurial ointment on erysipelatous parts has been strongly advocated. In mere constitutional erysipelas I should never think of it, but in the traumatic form, or that which follows ulcers, it is often beneficial, the extension of the erysipelatous process ceasing on ptyalism being established, which, from the susceptibility of the surface, is generally easily effected. In those cases of diffuse inflammation, favourable for mercurial influence, where the fever seems to be rather secondary and symptomatic, and the cellular inflammation well characterized, this is the mode by which I should attempt to produce its effect on the constitution, a mode, for reasons already stated, much less objectionable than administration by the mouth.

As to incisions through tumefied and *colourless* parts, I have never seen them productive of the slightest advantage. A sanguine exudes from the wound, and although suppuration may be subsequently established, the sloughing process goes on in the vicinity uncontrolled. I think it decidedly preferable to delay incisions till the skin changes colour and the part softens, or fluctuation becomes *distinctly* perceptible ; except in the cases of tension of fascia, &c. already alluded to.

When copious suppuration becomes once established we may anticipate recovery, unless there be a predisposition to thoracic or other visceral disease, when the patient may be very unexpectedly cut off. As to the treatment of the suppu-

* Dr. Osborne's mode of blistering by means of pledgets dipped in tincture of cantharides, and covered with oiled silk, would probably be preferable.

rative stage, both constitutional and local, it is so generally understood, that it would be quite superfluous to descant upon it.

ART. XVIII.—*An Essay on Laceration of the Uterus and Vagina, with Cases.* By J. T. INGLEBY, Member of the Royal College of Surgeons, London, Surgeon to the General Dispensary, and Lecturer on Midwifery at the Birmingham School of Medicine.

[Presented through Dr. Montgomery.]

PRELIMINARY REMARKS.

LACERATION of the uterus or vagina constitutes one of the most fatal injuries incidental to pregnancy and parturition, and in this respect the experience of Hunter, Denman, and Ramsbotham, obtains melancholy confirmation from practitioners in general. Notwithstanding this, the spirit of Dewees should ever animate us neither to regard these injuries as hopeless, nor relax our exertions towards their reparation so long as life remains, since several successful cases, which appeared most unpromising and even desperate in their character, are already on record,* and others, equally auspicious in their issue, remain to be added.

THE FREQUENCY OF THESE INJURIES.

From these injuries no class of women are exempt, but their comparative frequency, which is by no means well ascertained, varies, according to the published accounts, from one in three hundred to one in four thousand cases. I am disposed to regard their occurrence as much more frequent than is generally believed, and as corresponding with obscure and sud-

* See Professor Burn's Treatise, and Dewees' System, for reference to cases.

den instances of death. Intentional concealment of this injury is supposed to have been practised.

AT WHAT PERIOD OF PREGNANCY ARISING.

Laceration, (independently of any misplacement of the ovum,) though said to have been noticed as early as the fourth month of pregnancy, rarely occurs before the completion of the natural term. In an instance of abortion at the fifth month the violence of the pains seemed to me quite equal to produce a breach of surface—a mere exception, however, to the ordinary rule.

LACERATION UNUSUAL IN FIRST LABOURS.

On general principles it might be inferred that lacerations would arise more frequently in first than in subsequent labours; but the reverse of this is, I believe, an undeniable fact. Mr. Roberton, in particular, in his valuable paper on this subject,* has proved most satisfactorily that the accident very *rarely* happens in a first labour; and in twelve cases seen in consultation by Mr. Vickers, a most respectable and now retired practitioner of this place, the majority occurred in women who had suffered from previous severe labour; a fact confirmed by Ramsbotham, who never met with an instance of ruptured uterus in a first lying-in. An opinion has prevailed that the uterus will sustain with impunity a more powerful contraction in a first labour, than its textures are afterwards equal to, indeed that these textures become impaired by frequent child-bearing, and easily lacerate, but the deduction is unsupported by evidence. In the disease termed malacosteon let it be recollected, that the sacral promontory undergoes, during pregnancy, a sensible change in its figure, *antecedent* to any apparent softening of the pelvic bones in general, and the reason of this is familiar to all. This yielding, which is at first very slight, and is arrested after deli-

very, returns with a recurrence of pregnancy, and renders each act of parturition more difficult.*

THE REASON OF THIS EXPLAINED.

Thus we understand why lacerations occur more frequently in women who have borne children, than in cases of first labour; and the explanation is far more agreeable to sound physiology, than the doctrine which ascribes the injury to an attenuated state of the uterine tissues; a predisposing cause undoubtedly, but not the most frequent cause, as we shall presently endeavour to show. In confirmation of this opinion I have the satisfaction of adducing the experience of my valued and intelligent friend, Mr. J. M. Coley of Bridgnorth, who, after describing two cases of laceration which he very kindly sent for this paper, makes the following observation:—"In both cases the parietes of the uterus were unusually thick, a circumstance which leads me to doubt the truth of the opinion entertained by accoucheurs of the first rank, that this accident *generally* arises from an attenuation of the womb, occasioned by repeated pregnancies and the pressure of the projecting bones of the pelvis. In both instances, besides the remarkable firmness and thickness of the organ, the situation of the rupture would negative such an explanation of the cause of the injury. The contractions of the uterus were excessive, and in one of the cases the ergot of rye was given in very large doses, and the forceps applied during strong pains."

An open breach of surface in a very thin uterus may be connected with ulceration. It is perfectly well known that

* The commencement of malacosteon, by pain about the pelvis, and disability in moving, is liable to be confounded with rheumatic and neuralgic affections. An instance of this recently presented itself in a woman whose pelvis had become distorted to an extreme degree. We know very little of the actual state of the system which predisposes to malacosteon, but I am quite certain the opinion generally held that the bones in this disease never again acquire their natural solidity is incorrect. In *confirmed* cases the softening remains, but not in *recent* cases.

ulcers are found in the lining membrane of the organ; some of these have either followed strong injections, or could be referred to inflammation from other causes; others again have been regarded as syphilitic. Should an ulceration commencing in this structure be combined with softening and attenuation of the organ generally, the breach of surface (like an ulcer in the stomach or intestines) may pass quite through its parietes, almost inevitably so in the event of uterine contraction ensuing, the progressing process of ulceration, and the action of the uterus, each contributing to convert the simple breach into direct communication with the abdominal cavity. Suppose, for instance, (and I am informed such a case really happened,) a portion of disrupted placenta to be left firmly adherent to the greatly attenuated uterus, and ulceration to pre-exist, or to arise in consequence, what is to prevent the diseased part from giving way whilst the uterus is contracting to expel the offending substance? It scarcely need be observed that the presence of a piece of placenta, the circumference of a half crown, or even much smaller, will provoke violently expulsive efforts; to such a degree indeed did this take place in an instance to which I was called, that the os internum was forced by the strong pains absolutely through the external orifice, where it was for some time visible.

PREGNANCY RECURRING AFTER RECOVERY FROM LACERATION.

Nothing certain can be inferred from the fact of several women (who present rare instances of recovery from rupture of the uterus) having subsequently borne children without any renewal of laceration, since very much depends upon the foetal cranium, both as respects its dimensions and structure.

LACERATION CONSIDERED UNDER TWO PRINCIPAL HEADS.

Laceration may be considered under two principal heads; in the first there is an unusual resistance, and the womb acts with extreme violence; in the second, its powers of resistance

are defective, slight causes being equal to produce a breach of surface. The first head embraces difficult parturition in general, and occurs under all circumstances of the presentation, and every stage of labour and state of the uterine orifice, from the smallest to the greatest amount of dilatation. Usually, the laceration arises after a few hours of severe pain, the os uteri being tolerably well dilated, but unattended by a corresponding descent of the presentation. When the rent speedily follows the accession of labour, before the pains have acquired severity, or the uterus has scarcely begun to dilate, its structures will probably be found diseased.

SUBDIVISION OF THE FIRST HEAD.

The first head admits of the following classification: 1st, the laceration occurring when the presentation is above the brim, and entirely within the uterus; 2dly, as arising during the entry of the presentation within, or through the brim; 3dly, as occurring when the presentation is impacted within the bones; (in the second and third subdivisions the presenting part may be partially inclosed within the uterus when the laceration happens); 4thly, as happening during the actual delivery.

UNDUE RESISTANCE, AND ITS CAUSES.

In these several states an undue resistance is offered to the expulsion of the child in connexion with an inordinate action of the uterus, rendered so in some instances by the premature exhibition of the ergot of rye. The causes of this resistance include rigidity of the soft parts in general, and the os uteri in particular, an unyielding, or greatly enlarged, and perhaps hydrocephalic cranium, transverse presentation, malposition of the head, and, lastly, a want of correspondence between the axis of the uterus and the axis of the pelvis. This last mentioned cause, though pointedly referred to by Douglas, has been but little noticed by succeeding writers. In two examples of the kind detailed in this essay, the uterus was pendulous in

a very marked degree, and in one of these (a case of malostenon) the posture which the patient observed throughout the last weeks of gestation was exceedingly restrained. The same effect may be produced by tumours situated either above or below the brim, or whatever prevents the uterus from acting in the axis of the pelvis. "If the fundus is thrown much forward," says Douglas, "the foetus on the return of every pain will be forced against the lumbar vertebrae or anterior edge of the os pubis, in a direction very different from that of the axis of the pelvis."* Under these circumstances the vagina, as well as the uterus, will be very liable to rupture. But by far the most frequent of these several causes consists in an unnaturally small or projecting state of the pelvis, very generally of the sacral promontory.

Exostosis of the pubis, in connexion with uterine laceration, has been distinctly noticed both by Desman and Douglas, and Roberton has also described three cases of the same kind to which the laceration was attributable. In one of the instances mentioned by Douglas, not only was the brim contracted, but a thin, bony ridge, almost as sharp as the edge of a knife, was attached to the upper part of the osa pubis.† Mr. Roberton's paper contains in particular two highly important facts: first,

* *Essay on Rupture of the Uterus*, p. 99.

† A very interesting case, illustrative of the powerful action of the womb upon the full-sized foetal head in its passage through a slightly contracted brim, has recently occurred in my practice. A midwife, in attendance upon a young woman of low stature in labour with her first child, being unable to ascertain the nature of the presentation, applied to a surgeon for the purpose, who, being equally foiled, requested my opinion. I found the vagina filled with a large soft body, connected above the brim of the pelvis with the bones of the head. The soft body was evidently the scalp extensively detached, and in an inordinately tenuified and pulpy state. Auscultation indicated the extinction of foetal life, but as no symptoms of danger had appeared, instead of resorting to instruments, I recommended a few hours delay. In eight hours a still-born child was expelled by the natural pains. On examination of the head a very deep and extensive extravasation of blood and serum covered the whole of the right parietal bone, extending to the adjacent bones. The vessels of the brain were also excessively congested, but there was no escape of

we learn that in the great majority of his cases the degree of contraction was slight, the deficiency not exceeding half an inch in the conjugate diameter of the brim, yet producing the most formidable and fatal results. I have to regret not having examined the pelvis in every instance of laceration which I have seen, with a view of ascertaining whether these minor degrees of contraction existed or not. In the last case which I examined the conjugate diameter was defective about half an inch. Within the last month an opportunity presented itself of measuring the pelvis in a woman who died very suddenly during labour, from laceration, and the conjugate diameter was found to be only three inches. The patient was attended by a midwife. And secondly, it appears that out of thirty-six cases, the laceration happened in a very large proportion of them within twelve or thirteen hours of labour, measuring the time from the first indications of labour, and not from the occurrence of actual pain.

DEFECTIVE RESISTANCE, AND ITS CAUSES.

Under the second principal head, or laceration from defective resistance, the rent may arise from attenuation, or quite independently of the parturient action, spontaneously for instance, from some unnatural state of the peritoneal tunic of the womb, from obstetrical violence, and from accident, in the strict application of the word.

The attenuation which the uterus sometimes undergoes during the latter weeks of gestation, is both curious in itself and full of practical import; but the opinion that thinning of the cervix is owing to the foetal head having rested upon it through the last weeks of gestation; the quantity of liquor amnii being also perhaps defective, is far from conclusive. I once observed

blood within the skull. The nature of the effusion was clearly sanguineous, the pressure of which through the sutures, in connexion with the internal congestion, proving fatal to life. Forensically speaking, the case is both interesting and important. The conjugate diameter of the brim was defective half an inch.

this attenuation in a very marked degree, the whole vaginal portion of the uterus was extremely thin, resembling very thin brown paper, and when dilated to the extent of a crown piece, its structures were so closely in contact with the membranes that the line of demarcation was scarcely perceptible. Had not the child been small and premature, it is probable that laceration would have been the consequence. In one of the specimens in my possession, the parts surrounding the injury appear thinner than the textures in other parts of the organ. An attenuated state of the uterine and vaginal structures is incompatible with the ordinary contractions of the womb, and a very inconsiderable power, under such circumstances, is equal to produce a breach of surface. Thus, in a case mentioned by Dr. Denman, the laceration followed a few slight pains, the patient being in a state of weakness from the hemorrhage which attends presentation of the placenta. When deformity of the pelvis is superadded to a thin or diseased state of the uterine tissues, laceration will be almost inevitable. "Independently of disease, (says Denman,) the uterus may be worn through mechanically, in long and severe labours, by pressure and attrition between the head of the child and the projecting bones of a distorted pelvis, especially if they be drawn into points or a sharp edge."

When the natural elasticity of the peritoneum is considered, as well as the extension which it undergoes both in disease and pregnancy, particularly when pregnancy is associated with dropsy of the amnios, it may reasonably admit of doubt whether the healthy peritoneum will give way from mere distention. That this peculiar laceration may possibly depend upon force, suddenly exerted, a preternatural tenuity, or unsoundness of the peritoneum, or something unnatural in its connexions with the fibrous tissue, I am not prepared to deny, but from the cases already on record, and a case recently published,* in which the

* In *Med. Chir. Trans.* vol. xix., by Mr. Partridge.

peritoneum appeared quite healthy, I am disposed to refer the laceration to an irregular contraction of the uterus, either of the active or passive kind ; the active arising during labour, the passive during the shortening of the uterine fibres, and preparatory to the accession of pains. That the injury, whatever be its cause, may occur spontaneously, I am perfectly certain, for in one such instance the mischief was not preceded by any sensible contraction.

With respect to spontaneous laceration, a case is on record which possesses an unusual degree of interest,* and examples in support of the other positions will be found in this Essay. It will be seen that the laceration in one of the cases was produced by falling on a step, and as the abdominal coverings presented no appearance of injury, it may be presumed that the muscles made no resistance, and allowed the force to concentrate upon the uterus.

Laceration of other organs from external violence may be explained on the same principles ; for instance, a poor man, feeble, but convalescent from fever, in taking exercise in the dusk of a summer evening, walked unexpectedly but gently against a post ; abdominal pain and vomiting immediately ensued, and death within three days. The colon was found to be ruptured. A boy who received a kick from a horse on the abdomen, sustained a similar injury. A cart wheel passed over the abdomen of another boy, and the kidney was very extensively ruptured. In none of these cases were the abdominal parietes apparently injured.

LACERATION, CONNECTED WITH DISEASE OF THE UTERUS AND IRREGULAR ACTION.

The coincidence of pregnancy with unsound states of the uterine tissues, scirrhus and cancerous ulceration in particular, has been too frequently proved to need comment. Scirrhus

* Vide Mr. Ilott's case, in vol. vii. London Medical Repository.

of the os uteri can scarcely fail to impede the first stage of labour, and one of the worst cases which I have attended arose from this cause. In softening of the uterus there will be no elasticity, and a rent will easily be produced. Admitting that an unnaturally firm or fibrous degeneration, affecting a limited part of the uterus, will contract less perfectly in the expulsion of the child than sound structures, still the uniformity of the parturient action will be intercepted in a particular spot, and an irregular contraction necessarily ensue.

It is far more probable that a breach of surface will take place when the action of the uterus is irregular than when it is uniform: thus we find Velpeau referring certain cases of laceration to the violence attending the convulsive paroxysm, and I have given an instance of this, but such instances, as well as lacerations said to be produced by the violent movements of the child, are, indeed, most unusual. An opinion has already been expressed, that lacerations confined to the peritoneum cannot be disconnected from irregular contraction.

LACERATION OF THE VAGINA.

A laceration is rarely confined to the vagina, and it is a singular fact, that the contraction of the uterus will act upon the child, even to the laceration of the vagina, without producing a breach of its own surface. More frequently the rent commences at the point of junction between these parts implicating the vagina, the uterine orifice, and a small portion of its cervix, (sometimes the bladder,)* and such an injury cannot be considered less fatal than a laceration of similar extent, but confined to the uterus. According to Professor Boer, an extensive laceration and separation of the vagina from its attachments, is also the result of a large effusion of blood within

* The diaphragm also has been known to lacerate during labour, and the contents of the abdomen to pass into the chest.

its cellular substance.* Undoubtedly the canal may lacerate, partly by its own power, of which it acquires a material increase, in common with the uterus, during the latter period of gestation ; and allowing that it performs a very subordinate part in the actual expulsion of the child, we know that its contractile power is equal to expel the extremities of the fetus, when detained within it, as well as the placenta and coagula also, of no ordinary magnitude.

The vagina may also be lacerated by unskillful obstetrics, especially in the operation of version ; thus in attempting the delivery of a woman by turning, the practitioner passed his hand through the anterior part of the vagina into the abdomen, the intestines protruded, and the patient soon expired.

NOT POSSIBLE TO PREDICT THE DEGREE OF ACTION THE UTERUS
WILL UNDERGO.

But whatever may be the state of the uterine or vaginal textures, it is impossible either to predict the amount of exertion which they will bear, without involving a breach of consistency, or to determine the amount of compression which the foetal head will undergo in its transit through a contracted brim, consequently it is impracticable to determine from any circumstance of the labour, singly considered, the length of time to which a case may be safely deferred to the efforts of nature.

EXAMINATION PER VAGINAM.

At the commencement of labour an examination *per vaginam*, either with the finger or the hand, will afford a person conversant with these subjects tolerably conclusive information of the capacity of the brim, and should never be neglected. But when the descent of the head is attended with unusual difficulty, and the labour pains have squeezed a quantity of the

* *Medicina Obstetricia.*—See *Monahan's Synopsis*, page 3.

tumefied scalp, and also perhaps, part of the bony structure of the cranium, within and rather below the brim; unless the presentation admits of being raised in the absence of pain, it will be impracticable to acquire minute information; we may ascertain the existence of contraction, but the extent of the defect cannot be obtained with requisite precision. It becomes, therefore, of some moment to ascertain this point very early in the labour, or indeed prior to its accession, in persons who have already had difficult labours, and given birth to full grown but dead children, as the capacity of the pelvis in such persons will almost certainly be found defective. The depression which the sacral promontory leaves over either parietal bone, is sometimes very marked, &c.; but an unnatural degree of projection of the sacrum, will not even be suspected, when the part is not easily reached with the finger; but this is a delusion which I have endeavoured to expose elsewhere.

Whenever it becomes necessary to pass the hand, the importance of attending to the axis of the brim seems most obvious; and I have alluded to a case of vaginal laceration, which would not have occurred had this precaution been observed. Considering that the rent sometimes takes place during the actual expulsion of the child, it would seem desirable to examine, after every delivery at term, not only the perineum, but also such parts of the internal genitals as lie within reach of the finger.

TISSUES IMPLICATED.

Rupture of the uterus generally includes the whole of its textures, occasionally (though rarely) the mucous and fibrous substance gives way, and the peritoneum remains entire; and still more rarely, the peritoneum lacerates, exposing the fibrous structure and perhaps rents penetrating its substance.

SEAT, DIRECTION, AND EXTENT OF THE RENT.

Laceration may arise in any part of the uterus, but the cervix gives way more frequently than either the fundus or

body, tearing, as Mr. Roberton observes, "with nearly equal readiness in all parts of its circumference," indeed its whole circumference has been involved in the mischief. With a single exception, the cervix uteri has been more or less lacerated in every instance which I have seen, the rent being oblique in its direction rather than longitudinal, extending to the body and side of the organ. The transverse direction is said to occur most frequently, but of this I have only seen a single instance; the rent was confined to the fundus, and was the result of accident.*

Laceration of the vagina rarely extends to its inferior portion; the rent is usually more or less oblique, but it will tear in any direction, including, or very nearly so, its entire circumference, and thus virtually dis severing its connexion with the uterus. Laceration of the substance of the uterus, attended with pelvic deformity, commences, according to Mr. Roberton, in that portion of the uterus which is contiguous to the obstruction, or, in the words of Denman, "at that part which is opposed to the sacrum, if this be distorted; and more especially if there be a pointed bone on any part of the internal surface of the pelvis."† In whatever part it may commence usually the rent is at once complete, communicating with the abdominal cavity; but it may be incomplete at the first moment, implicating, for instance, the mucous and fibrous tissue, and leaving the peritoneum entire, and probably passing into the abdomen on the uterine action being slightly renewed. Again, the peritoneum may be largely detached, whilst the amount of the rent in the fibrous tissue is comparatively insignificant. Lacerations of trivial extent, and confined to the lining membrane at the uterine orifice, occur not unfrequently, especially in first labours; and similar injuries have been produced by the detachment of the morbidly adherent placenta. Usually they prove unim-

* See Case, No. 8.

† On Rupture of Uterus, pages 8 and 9.

portant, but I once examined the body of a woman who died suddenly in a fit of eclampsia, after an attempt had been unsuccessfully made to remove the placenta, and many parts of the lining membrane had been lacerated by the finger nails. One of the most intelligent surgeons of the present day (Mr. Evans of Belper) informs me, as the result of his own observation, that laceration of the *cervix uteri* is more immediately fatal than laceration of the *fundus*. This we can fully understand, assuming the laceration to be situated beyond that part of the organ to which the placenta had been attached. A little blood may possibly enter the abdomen, but the lochia will pass almost entirely *per vaginam*, and it is to this circumstance that the little danger which attends laceration of the vaginal part of the uterus merely may be mainly ascribed. The only instance of the injury, thus limited, which has come before me was occasioned in the following manner:—A practitioner, in a violent effort to extract the head with a long pair of forceps, permitted the blades to slip off, and such was the extent of mischief, that the whole circle of the vaginal part of the uterus cloughed away,* together with a considerable part of the posterior surface of the bladder, an incurable vaginal fistula being the result.†

Laceration which arises before labour is said to be denoted by certain precursory signs, viz. tightness of the abdomen, cramp, or an excreting pain in a defined spot, together with a degree of tenderness on making pressure over the hypogastrium, and great restlessness: little reliance, however, is to be attached to these signs.

The presumptive signs which appear during labour are less

* In this respect the case resembles Mr. Scott's in the 11th vol. of the Med. Chir. Transactions.

† After a time the patient became pregnant, and aborted at the fourth month. Notwithstanding the statement of the French, that parturition is particularly easy in women who have suffered excision of the *cervix uteri*, the dilatation of the orifice was in this instance attended with very great difficulty and danger.

ambiguous. Thus if the cranial bones are pinched between the sacral promontory and the symphysis pubis, or only the tumid scalp is squeezed within or below the obstruction, if the os uteri remains unusually high, and one or both lips are thick and oedematous, if the waters are discharged, the pains powerful, but unattended with any material descent of the bony structure, we may presume upon the probability of the injury, and adopt measures for promoting the delivery as speedily as we consistently can. Besides the duration and progress of labour, we are to take into account the existing state of the constitution, the state of the soft parts, the result of auscultation, and the circumstances of preceding deliveries.

As it is very possible to *prevent* laceration; the skilful management of the labour becomes a matter of the highest moment. If the pelvis is contracted even in a slight degree, and the previous labours have been attended with difficulty, our suspicion should be raised, since a continuance of the symptoms just enumerated will be quite incompatible with the patient's safety. In this respect the facts adduced by Mr. Robertson ought especially to influence our practice, for delay may be inadmissible, the uterus having in many instances very unexpectedly given way. Two cases of this nature, with which I am acquainted, afford apt illustrations. In the first the pains were powerful, and the head (impacted; I believe, and) within reach of the forceps; the laceration occurred during a violent pain, which suddenly extinguished life. The second occurred in a woman who had borne several children, but who was then bedridden from malacosteon, and whilst the practitioner had walked into the adjoining street for the perforating instruments, the uterus burst, and on his return the child had passed into the abdomen. The result was speedily fatal. It would be easy to multiply similar examples; not that the use of instruments can be justified merely on account of a trifling defect of space in the antero-posterior diameter, for though hesitation in this respect may be quite unallowable in the higher kinds of contractions, it

is far otherwise where the defect does not exceed three quarters of an inch, or possibly even an inch, provided the cranium does not exceed the standard, and is tolerably yielding. With much propriety then does Ramsbotham declare this question to be one which "can only be decided by sound judgment exercised on a sight of the case."^{*} A large sized cranium may indeed prove very yielding, and by its elongating properties admit of its safe propulsion through a contracted brim; whilst a firmly ossified cranium, even of a standard size, will, under the like circumstances, resist the most powerful uterine action. The head, however, may be too large to pass the best formed pelvis without endangering the integrity of the uterus. "It has been calculated (observes Professor Burns) that in three-fourths of the cases of rupture the child has been a male."[†] The superiority of the size of the head of the male child over the head of the female being considered, it will be impossible to doubt the great influence which the full sized and firmly ossified head exerts in producing laceration. Several peculiarities may endanger laceration, malposition for instance, but this admits of rectification either with the hand or forceps. States of rigidity favour laceration, but these yield to the relaxing influence of ant. tart., or what is better, ipecacuanha, as well as bleeding, and the warm bath; the unnatural inclination of the uterus forwards yields to position, the application of a firm bandage, or a support equal to maintain the organ in the axis of the brim. Douglas, indeed, recommends turning in a labour of this description, an operation which can scarcely be needful. Laceration is also endangered in very difficult transverse presentations. Mr. Radford, in a very interesting and valuable paper,[‡] has proposed, in cases of turning, that one leg only shall be brought down, the other being left to aid the breech in dilating the os

* *Practical Observations*, vol. i. p. 385.

† *Burns' Midwifery*, eighth edition, p. 491.

‡ See *Edinb. Med. and Surg. Journal* for 1st April, 1832, p. 256.

externum, and thus expediting the delivery of the head. That the life of the child will be consulted by acting upon this proposition is quite clear; indeed Mr. Radford's high authority is a sufficient guarantee in its favour.

Where there is found to be a moderate quantity of liquor amnii, or at least where no unusual difficulty to the delivery presents itself, the advantages of this proceeding must be freely conceded, but I doubt the propriety of extending the plan to all cases indiscriminately. If, for instance, the action of the uterus was very powerful, and the liquor amnii nearly drained away, it would be no easy matter to seize an inferior extremity; but if the feet lay within reach, I certainly would secure them both in preference to one, under the impression that I might not only fail to alter the position by means of a single foot, but encounter a degree of resistance which might end in laceration. I have given the details of a case of this description,* and in a second and very similar instance of difficult turning, in which the head, arm, and foot, were in the vagina simultaneously, the patient died soon after her delivery. The body was not examined, but I am persuaded the uterus had ruptured. In a third instance, I succeeded in seizing a foot, after several unsuccessful attempts had been previously made, but the difficulty of completing the version was even then far greater than I could have supposed.

Notwithstanding the respect I have for Mr. Radford, and the deference which is due to his experience, I cannot but make this exception to his conclusions. In a general point of view his directions will necessarily lead to a material improvement in practice. Under a very violent action of the uterus, the tightness instantly cramping the hand, and imparting to it a sensation of fresh cut Indian rubber, it is surely better to deprive the organ of some of its resistance either by venesection, or other-

wise by creating nausea, antecedent to renewing an attempt to turn. Opium, in safe doses, may be too tardy in its operation. Loss of blood produces an instant effect. Thus, in a most difficult and almost hopeless case of turning, in which I was consulted, a practitioner accidentally separated a portion of the placenta, and such was the effect of the hemorrhage, that the next attempt proved successful. The hot bath has been advocated in these cases.

SYMPTOMS WHICH ATTEND THE INJURY.

The symptoms which denote laceration will correspond with the circumstances under which it happens. When occurring during labour the injury is usually characterized by the following assemblage of symptoms. The patient may possibly be conscious of the rent, and has been known to utter a sudden shriek, the noise, according to Denman, having also been heard by the bystanders. It is more probable that she will be merely conscious that the child has suddenly risen high in the epigastrium, and its members may perhaps be traced by the hand, but this will not be the case when the breech and back are opposed to the abdomen, and the limbs directed to the spine. The pains suddenly become feeble, or cease altogether, especially when the laceration is situated at the fundus. In rare cases (as will be shewn) the pains continue with little abatement. Vomiting, first of the aliment, and then of dark-coloured secretion, speedily supervenes; the countenance becomes pallid and anxious, the pulse feeble and rapid, the surface cold, attended, perhaps, with cold perspiration, a progressive sinking of the vital powers, and quick respiration; the abdomen becomes tumid, tender to the touch, and peculiarly painful on disturbing the position of the child. The amount of hemorrhage, both *per vaginam*, and within the peritoneal sac, may either be insignificant or very considerable, for this will mainly depend upon the state of the placenta and situation of the head, which possibly may be impacted in the vagina; otherwise a sanguineous

discharge will be highly probable. If the transmission of the cranium through the superior aperture has been very difficult, and the presentation more or less impacted, it can scarcely recede. Its recession, therefore, is rather an incidental than a necessary result, and will mainly depend upon the circumstances just stated. When the rent arises at the moment of delivery, the symptoms will be more or less obscure, and the abdominal pain may be too inconsiderable to allow a suspicion of this particular injury to be raised.

In connexion with the symptoms of uterine and vaginal laceration, it will be perfectly relevant here to make a few more general observations. Notwithstanding that the pains usually disappear after the injury, no certain inference can be drawn as to the integrity of the uterus from the fact of the pains continuing, since they will be defective rather in proportion to the depression of the vital powers than to the extent of laceration. In one very remarkable example, although the pains were weakened by the laceration, they continued powerful for many hours, and created a delusion as to the actual nature of the case. In an instance of severe eclampsia, the cervix uteri lacerated in its anterior and superior position, and permitted the finger to enter the abdomen, but notwithstanding this, the child was subsequently expelled by the natural powers, and the result was successful. I mention this case on the authority of Mr. Smith, a most respectable surgeon of Lancaster, in whose practice it occurred. When the fundus uteri is not implicated in the rent, the pains will perhaps continue, and yet very powerful pains may suddenly cease at a moment when the expulsion of the head seems close at hand, although the laceration shall be confined to the vagina. It is improbable there will be any after pains properly so called; their appearance would be most salutary, as tending to bring the sides of the laceration more directly into contact. According to Burns, the pains will continue more or less as long as the child remains *in utero*.

DIAGNOSIS.

The symptoms of laceration of the vagina are said to differ in toto from the symptoms which denote laceration of the uterus, especially by Denman, who refers to Mr. Goldson's pamphlet for a correct diagnosis. Whatever difference there is must apply to the early stages of the injury, for, after a given time, the symptoms will be the same. It is not always practicable to ascertain the exact boundaries of a laceration: the peritoneum, though detached for some extent, may not be disrupted, or very disproportionately to the extent of detachment. The situation of the uterus will depend chiefly upon the state of the vagina, which, when extensively separated, may permit the uterus to attain a sudden elevation within the abdomen, and it may then be impracticable to reach the organ. Thus in very difficult turning cases, the almost entire separation of the vagina from the uterus has occurred whilst the practitioner has been engaged in changing the position of the child; the uterus instantly passing into the abdomen, and beyond his reach. I am acquainted with two such instances. From these and several others of a similar kind, which have been reported to me, it appears that a laceration of the superior portion of the vagina, including nearly its whole circumference, and the consequent recession of the uterus beyond the reach of the finger, is an occurrence by no means unfrequent. Nor is it always easy to determine whether a laceration of the cervix uteri has extended to the vagina, on account of the uterine orifice and the vagina presenting, for a short time after delivery, an apparently continuous surface.

MODE OF ASCERTAINING THE EXISTENCE OF LACERATION.

When laceration is suspected to have taken place, not a moment's time should be lost in ascertaining the fact with certainty. In the words of Dewees, "This is to be done by a careful examination of the abdomen and the uterus: the first,

by the application of the hand externally; and the other, by the finger or hand *per vaginam*." By passing the fingers through the rent, and by feeling their extremities against the inner surface of the abdominal parietes, we obtain, in the words of Ramsbotham, "an indubitable test of the accident."

VENTRAL PREGNANCY AND ITS SYMPTOMS.

Most of the reported cases of ventral pregnancy are supposed to result from rupture or ulceration either of the uterus or one of its appendages, and the consequent escape of the foetus in the abdominal cavity. The symptoms denoting these peculiar forms of laceration are usually those of collapse, but their obscurity is such as to defy an accurate diagnosis.

LACERATION, HOW TERMINATING.

Laceration of the uterus and vagina usually terminates in death, the patient sinking either from collapse, hemorrhage, or inflammation and its consequences. Now and then, the event is more auspicious.*

COLLAPSE.

The prostration which so frequently attends these injuries seems referrible to the suddenness of the shock, the nervous system being incapable of an efficient reaction.

HEMORRHAGE.

For some hours after the injury, the discharge may be

* The absolute separation of the whole uterus from the vagina, as the result of laceration or sloughing, would seem quite incompatible with the preservation of life, but an instance of this kind, which terminated favourably, will speedily, I believe, be placed on record. The separation is said to have taken place the second day after delivery, and the specimen, which embraces the uterus in a state of inversion, together with its ligaments and a small portion of the vagina, has just been deposited in the anatomical museum in this place. The perfect recovery of the patient constitutes the singular and interesting feature of the case.

very inconsiderable, but on reaction taking place, the lochia pass in large quantities into the abdominal cavity. I once found seventy ounces of dark-coloured blood effused in the abdominal and pelvic cavities.* In another example, the effusion, which took place within ten hours, amounted to forty ounces.

INFLAMMATION.

Inflammation, although common to almost all lacerations, is more likely to arise from the presence of the child amongst the viscera, than from any other cause. It is also soon produced by the effusion of lochia within the peritoneal sac; the pain, feverishness, vomiting, and rapidity of pulse, being commensurate with the extent of effusion.

PATHOLOGY.

The post mortem appearances will correspond with the period which has intervened from the injury. When life is not immediately destroyed, more or less blood and lochia will be effused, and the intestines will present an injected and dark appearance. We find also the ordinary products of peritonitis, viz. false membrane, with serum, and in some cases the membranes of the placenta have been found adherent to the viscera by lymph. The edges of the laceration may either be perfectly healthy, or present a very dark appearance; but if the labour has been protracted the wound will most likely become gangrenous. The fact of the membranes of the placenta having been found connected to the viscera by coagulable lymph,† seems to countenance an idea of existing vitality. Douglas, in his account of a post mortem examination, observes, "It was remarkable that wherever the membranes or placenta had come into contact with the internal surface of the abdomen, they adhered with a considerable degree of firmness, and that on the

* Case No. 8.

† See Case No. 4.

coats of the intestines there were every where signs of inflammation.* J. Hunter believed that he once observed motion in the placenta after its removal from the body. In cases of laceration which have terminated in recovery the point of union is said to have been distinguished at a remote period after the injury.

PROGNOSIS.

The prognosis, it need scarcely be observed, should be unfavourable in every case of laceration which communicates with the abdomen.

TREATMENT.

In treating uterine laceration before delivery we have to consider, first, the condition of the uterine orifice; 2dly, the situation of the child; and 3dly, the state of the general system. Respecting the treatment of this injury, under its least complicated form, by immediate delivery, little need be said. By universal consent, in this country at least, it is understood that if accessible to the forceps the head should be promptly abstracted; when above the brim, provided it does not retreat when a moderate pressure is applied against it, or can be sufficiently steadied, perforation must always supersede the dangerous operation of version in the abdomen. Dr. F. H. Ramsbotham seems to think perforation scarcely applicable to these cases, but let me assure this respectable practitioner that I have resorted to the measure with admirable effect. The case was peculiarly adapted for perforation, the body of the child being in the abdomen, and the head far above the brim, and completely beyond the reach of the long forceps.† Assuming the child to have entered the abdomen, the practice of immediate delivery, by passing the hand through the rent, obtains very general sanction in this country, but with what success I am

* Douglas on Rupture of the Uterus, p. 48.

† Case 5.

unable to say. Notwithstanding every precaution, descent of the intestines will be very liable to happen, a circumstance which renders version in the abdomen so extremely hazardous. In one instance of the kind with which I am acquainted, the extraction of the child was followed by a large protrusion of the intestines and the speedy death of the patient, and the same result took place antecedent to delivery in a laceration of the vagina. The practice of version in the abdomen could not be justified in a case of materially deformed pelvis. Baudelocque advocates gastrotomy wherever the forceps are inapplicable, and limits the extraction of the child through the laceration to cases in which the feet present, or else where the injury is confined to the vagina.

Laceration of the uterus, during labour, was so generally fatal, that Dr. Denman's great experience did not afford him a single undoubted instance of recovery, and he submits this question : " What benefit can result to the patient or to society, or what credit to the profession, from an operation by which her present feelings are in some degree aggravated, and by which neither the lives of the parent or child were ever known to be preserved." Cases of recovery have unquestionably occurred since the time of Denman, and I am enabled to record two more. Modern practitioners, so far from acceding to the doctrine advocated by this truly admirable writer, enforce the propriety of immediate delivery *per vaginam* whenever the state of the os uteri and the laceration admit of it. Although the danger of forcibly dilating the uterine orifice under great resistance does not admit of question, its accomplishment, difficult as it may be, is not to be compared with the consequences likely to ensue from the child being allowed to remain in the abdominal cavity. Averse, as every rational practitioner must be, to the employment of force, I would maintain a gentle, but persevering endeavour to open the uterus, until it was evident that the resistance could not be overcome by safe means. The escape of the child within the abdominal cavity is not only highly danger-

rous, but becomes increasingly so, and surely we are warranted in incurring a trifling risk to remove a certain and great peril. Dr. Ryan* alludes very pertinently to the fact of the uterus not contracting after the rupture, and from this urges the propriety of passing of the hand with rather more than usual perseverance. The chances of success will of course be lessened when the injury is confined to the body and fundus. In two post mortem examinations the uterus was found in very different states, the rent being very little contracted in one of the cases, and very greatly so in the other. We must not be deterred from dilating the orifice by a trifling resistance, which will frequently yield to perseverance; and although violence is never allowable, I am persuaded that the dilatation may be accomplished under somewhat adverse circumstances. The earlier the operation is undertaken the better, a few minutes delay may be inadmissible. The practitioner however may not be on the spot, and collapse may have set in ere his assistance is obtained. In such a case, (desirable as a speedy delivery is,) unless the head lies within reach of the forceps or perforator, it may be necessary to wait until the patient is somewhat recruited. Unsafe as it is to act during a formidable exhaustion, delay will be inadmissible when signs of reaction appear, for by waiting we may perhaps encounter a very formidable resistance, the contraction of the rent being regulated not only by its precise situation and the period which may have intervened from the injury, but also by the state of the vital energies. That a firmly contracted uterus and an exhausted state of the system soon after delivery are perfectly compatible, is a fact with which I am most familiar; indeed the uterus has been seen to contract very sensibly even after the extinction of life. But unless the laceration is confined to the fundus or body of the organ, the degree of resistance can scarcely prevent the passage of the hand, especially when the injury extends to the vagina. Assuming, however, the impossibility of delivery *per vaginam*, either by reason of the con-

tracted state of the wound, or the firm closure of the uterine orifice, the child having escaped into the abdominal cavity, is it justifiable to open the peritoneum? if so, at what period, and in what state of the system? Several of our most eminent authors are opposed to the principle of this operation, and, with a single exception, I have never seen a case sufficiently early after the injury to allow the question of gastrotomy to be raised. The performance of the operation instanter, with a view of preserving the life of the child, presupposes a presence of mind which few practitioners possess, added to which, time will scarcely allow the consent of the patient and friends being obtained sufficiently early. The chance of the infant surviving in this unnatural situation must depend partly upon it being still inclosed within the membranes, and partly upon the placenta continuing more or less in apposition with the uterus. In an interesting example of laceration of the fallopian tube at the fifth month of pregnancy,* the movements of the foetus in the abdominal cavity were sensibly felt by the mother for several hours after the laceration had occurred, but the membranes were entire, and the placenta preserved its connexion with the tube. Douglas, who ridicules the idea of the child surviving within the abdomen, says it would be performing the Cæsarean operation with every disadvantage.† An opinion in which I cannot acquiesce, since the result of two cases of Cæsarean operation, in which I have been engaged, leads me to view the mere abdominal incision with very different feelings. The operation is not half so dangerous as the Cæsarean, whilst the celerity with which it is done, the absence of hemorrhage, and the facility with which the intestines are confined within the abdomen, all tend to divest it of much of its terror. When properly timed it would appear to be infinitely safer than the alternative of allowing the child to remain in the abdominal cavity. Several cases are recorded in which the mother has recovered, one by

* Edinb. Med. and Surg. Journal for 1st October, 1834.

† Page 106.

Frank, and another by Mr. Haden, in which both lives were preserved.

It is, indeed, a most serious affair to expose so great an extent of peritoneum, with the almost certain prospect of more or less inflammation, but under an impression that the presence of the child amongst the viscera will be more dangerous, I would not hesitate (assuming circumstances to be favourable) to recommend the abdominal incision, as affording the best chance of recovery to the patient. Unless a formidable exhaustion should supervene, delay will be inadmissible, and under any circumstances, the operation should be undertaken as early as the nervous system has overcome the immediate shock, lest reaction should rapidly pass into inflammation. Whatever treatment be adopted, most important will it be to prevent inflammation, but how is this to be accomplished? the effusion of lochia in the abdomen will be influenced partly by the site of laceration, and partly by the actual state of the wound. If the contraction of the uterus fails to detach both the placenta and its membranes, there can be no closure of the wound, and the lochia must enter the abdomen. This, it will be seen, happened in one instance,* in consequence of the membranes retaining their connexion with the uterus. Assuming that the patient can bear the fatigue, a stout infant should be put to the breast every now and then, partly to excite the secretion of milk, but mainly to provoke a sympathetic action in the uterus, and thus assist in closing the edges of the wound†. In common cases, we know that the uterus contracts most sensibly for some days after delivery, whenever the child is put to the breast. The passage of the lochia *per vaginam* will be further promoted by apply-

* See Case, No. 8.

† My friend, Mr. Knowles, recently called me in consultation to a case of labour, in which it was indispensably necessary to resort to the Cæsarean operation. On the principle of producing after pains, and assisting the closure of the wound in the uterus, I recommended the infant to be frequently put to the breast, with, I think, a good effect. Both mother and child survive.

ing compresses, together with a very firm support around the abdomen, and placing the patient upon an inclined plane. To lay open the abdomen, after peritonitis has ensued, would be a most injudicious measure, and opposed to the best principles of surgery, since the product of inflammation, viz. effusion of serum, deposition of lymph, and the consequent adhesions, would be in course of formation. Inflammation, whether affecting the peritoneum generally, or the intestines in particular, will be recognized by extreme tenderness over the abdomen, greatly aggravated by moving the child, and the usual symptoms of this disease. It must be treated by warm baths, fomentations, and the repeated application of leeches to the abdomen and vulva, poultices to the vulva, glysters, tepid gruel, mild aperients, and opiates. Under such circumstances the foreign bodies must be consigned to the usual course of nature. Should the patient surmount the inflammation, she will have to contend against a long and harrassing ulcerative process, attended with great pain, purulent discharges, and constant irritation, which will greatly impair the general health, if not occasion a fatal result, for, according to Doctor Dewees, these persons ultimately perish. The child, insulated and surrounded by a membranous cyst, cretaceous incrustation or other substance, has been known to remain in the abdomen, innocuous, for an indefinite time, but such a termination we are by no means entitled to expect, and it is probable that some of the reported cases of recovery were really extra-uterine at their origin. Douglas was of this opinion, and thought death inevitable, whenever the child was allowed to remain in the abdomen. I shall now adduce a few cases, each case possessing an interest peculiar to itself, and illustrating some of the positions here enforced.*

* This communication occupies so considerable a portion of the space allotted to original Papers, that we are compelled to postpone the publication of the cases transmitted to accompany it. We have been reluctantly obliged to reserve some valuable communications for the next Number, from want of space.—ED.

ART. XIX.—*Observations on Fractures; being the Substance of Clinical Lectures delivered in the City of Dublin Hospital.* By JOHN HOUSTON, M. D., M. R. I. A., &c. &c.

THERE are, in this country, two very opposite courses followed in the treatment of fractures of the lower extremities; one, which consists in laying the broken limb, during the first few days after the accident, in a flexed position, and, subsequently, either preserving the same posture all through the cure, or, after a given period, changing the bent condition of the limb for the straight posture: the other, that of placing the limb at once in the extended position, and applying, from the onset, an apparatus destined to keep it, all through the period of healing, immovably in that state.

The respective advantages of these two plans have been frequently discussed, but, as it appears, without the establishment of any general bias in favour of either the one or the other. In the midst of this diversity of opinion, and absence of any specific rule of practice, I have attempted to put the several methods to the test of experiment, and shall endeavour, in the following pages, to make known the result. I propose, in the prosecution of this object, to state in the first instance, as briefly as possible, several cases in which these different plans of treatment were tried; and, secondly, I shall attempt to draw from them such inferences as the facts, aided by physiological considerations, appear to justify.

I shall, in addition, describe, for the information of those who may be seeking after a convenient and efficacious apparatus for the treatment of fractures of the lower extremities, one which I have found to accomplish every desirable indication.

CASE I.—Joseph Woods, an old soldier, of sober and regular habits, admitted May 3rd, 1833, received a fracture of the bones of the left leg, by a kick on the shin from a horse drawing the car on which he was seated as driver; he fell to

the ground, and in the fall the leg was much twisted and bent. He was brought to hospital immediately, with the limb in the following condition: there was an oval-shaped wound on the shin, between three and four inches long; the bones were both broken, and the tibia was extensively denuded of periosteum; the fracture was oblique, and the limb shortened for nearly two inches, but the over-lapping was not of the ordinary description: it was not the result of the slipping of one oblique surface over the other, for, by some application of violence, which cannot be explained, the lower fragment had got to the reverse side of the upper, from that at which the obliquity existed, and had passed a long way up its side, so that the two slanting surfaces of the fracture looked widely away from each other. The effect of this peculiar displacement was such as to render reduction impossible by the usual force of manipulation. The man suffered great agony from pain and spasms of the limb, and the hemorrhage was alarming. Amputation of the limb, or sawing off the projecting extremity of the bone, to allow of reduction, appeared at first sight the only alternatives; but before proceeding to either of these extremes, I determined to attempt by force the replacement of the fragments, and, accordingly, by means of a lac applied to the thigh of the injured side, and another to the leg, I exerted extension and counter-extension, as in a case of dislocation of the knee, regulating the force so as gradually to fatigue and overcome the spasmoidic action of the muscles. A force equal to that employed in the reduction of the most obstinate dislocations, was for several minutes exerted, before the points of the fragments were got to pass each other, but finally the object was gained; the two flat surfaces of the fracture were brought once more into apposition, and on the instant of the reduction, the patient exclaimed that he was at ease. The nature of the resistance offered by the muscles in the reduction of this fracture, will be readily understood when it is considered, that in bringing the spiculated points of the bones across each other, so as to give them an op-

portunity of reaching the relative places which they had originally occupied, it became necessary to pull all the muscles of the limb, both flexors and extensors, to such a degree as to cause an elongation of them, at least one inch greater than they had ever before been subjected to ; and the sudden and almost complete subsidence of the pain, on the setting of the bones, is to be accounted for by the relief which the muscles experienced in being restored to their natural relative bearings, with respect not only to each other, but to the bones which gave them natural and due support. The agony which the man suffered had, almost solely, reference to the deranged condition of the muscles. The solution of continuity in the bone contributed, but in a minor degree, to its production.

The patient's limb was settled steadily in the extended position, the gaping wound was stuffed with lint, and kept wetted with cold lotion ; a large opiate was administered, and sleep encouraged. For a week, neither the limb nor the dressings were disturbed, and from the moment of the reduction he had not, during all that period, the least feeling of spasm ; the pulse never rose above 80 ; the tongue remained moist ; he had no thirst ; and by an opiate he slept the greater part of each night. On the seventh day it became necessary to change the dressings, and on the instant that the extension and lateral support, furnished by the pads and splints, were relaxed ; the limb began to tremble, in spite of every effort to keep it steady ; all the muscles were seen to work in convulsions, and the man screamed aloud with agony.

The soiled dressings having been removed, and fresh ones substituted with as much expedition as possible, and re-applied as before, the spasms and pain again subsided, and the patient found himself once more at ease.

During the first three weeks, the condition of this man was much as has been described ; on every occasion in which the muscles were deprived of the artificial support given to them by the splints, in lieu of that which they had lost by the fracture of

the bone, they fell into painful spasmotic action, which was always, however, checked by the proper re-adjustment of the dressings. The wound threw out healthy granulations; the bone became gradually covered in, and, after casting off some trifling exfoliations, healed with the preservation of its original length and shape.

The great size of the external wound, which in the beginning made it appear so frightful, was no doubt of much advantage in the subsequent stages of the reparation, as it allowed a ready escape for the purulent matter which was formed in great abundance, and thereby prevented the formation of remote abscesses and fistulous passages.

The patient remained in the hospital for upwards of four months, and after a short visit to the country, returned into the service of his master. He is at present in excellent health, and competent to the discharge of constant and laborious duties.

CASE II.—C. D. M'Carthy, a shopkeeper, *æstat.* 31, admitted August 9th, 1835. About two hours before admission, when attempting to get out of a steam-carriage before the vehicle had completely stopped, he had fallen to the ground in such a manner that one of his legs got under the wheels, two of which passed in quick succession over the limb, breaking both bones in three places. The upper fracture, at the commencement of the middle third, was compound; the middle, about three inches lower down, was both compound and badly comminuted; and the lower, near the ankle, was complicated by extenasion into the joint. The leg was much shortened, and when laid on the bed appeared so deprived of support, from the lesion of the bone, that the foot lay completely on its inner side. It being the opinion of some present in consultation, that it was possible to save the limb, an attempt was determined on being made at the accomplishment of this desirable object. The limb was accordingly put into splints, in the manner represented in the annexed plate, leaving out only the tailed bandage; an anodyne was ad-

ministered, and the strictest quiet enjoined. For some days nervous tremors, which he could not control, often came over him; the pulse did not rise above 95, and he enjoyed a good deal of sleep. The limb was occasionally uneasy, but not actually painful; and he never suffered from spasmodic action of the muscles, although, in the general tremor, the injured limb took a leading part, and I have no doubt would have become convulsed but for the manner in which it was secured by the dressings. On the third day, a fungous mass suddenly sprung up from the opening leading to the middle fracture, insensible to the touch, about the size of an orange, and consisting, apparently, of lacerated and protruded muscle, mixed with grumous blood and a yellowish substance like coagulable lymph. On the fifth day the foot began for the first time to swell, and a red and tender line was formed along the tibia; the fungous mass became emphysematous, and discharged a sanguous fluid; but it subsequently disappeared, having its place supplied by a surface of granulations. From the seat of the fungus the integuments sloughed all about the limb, for a breadth of about two inches. From this date, up to the 20th of the month, he had several exacerbations of fever; the swelling extended into and above the knee, and profuse discharges issued from the openings in the skin. At the seat of the middle fracture the limb at this period appeared to be nearly severed into two, the lower part being only held in connexion with the upper by the tendons, and probably also by the vessels and nerves, as the foot remained, still warm, and as granulations were present in abundance on the surface of the lesion appertaining thereto. Long before this date the necessity for amputation became obvious, but from the amount of tumefaction present, it was considered that had the operation been attempted, it should have been performed above the knee, and as the man was most anxious to have the joint saved, the removal was put off from day to day, having due regard to the limit beyond which it might be unsafe to procrastinate. On the morning of the 22nd, a favourable

opportunity having presented itself, as indicated by a good night's sleep, together with a diminution of the swelling, and subsidence of febrile symptoms, the operation was performed below the knee, and within half an inch of the wound connected with the superior fracture. The circular amputation was that practised. The skin was brought together in a transverse line, and three sutures were inserted. In sawing away a portion of the anterior projecting margin of the tibia, to avert after-protrusion through the skin, the periosteum was found thickened and vascular, and in such a high condition of sensibility, that extreme pain was produced in the attempt at scraping it from the bone. The flaps, as was to be expected, did not unite by the first intention, but, nevertheless, by being held in contact for three days by the sutures, they acquired a fixed degree of approximation, which left only a narrow line to be healed by granulations, and after the cure was completed the cicatrix was scarcely larger than would have remained had the healing been accomplished by the first intention. This is an advantage which I have frequently found from sutures in operations giving rise to large flap-wounds, and which leads me, in almost all such cases, to their adoption. I have had occasion particularly to notice such effect in a case of amputation of the thigh, which I performed for a large incurable ulcer of the leg, but after which the patient died within a fortnight of inflammation of the veins of the limb. In this case, which had been treated by sutures, I remarked that, although no primary union had taken place, the flaps had acquired such a firm degree of approximation over the face of the stump, as to hold their ground after death, and even to spring towards each other, when let loose, after being held forcibly asunder.

My object, however, in noticing this case, has not so much reference to these latter circumstances, as to make it serve in illustration of the value of extension and steadiness of posture in warding off extreme sufferings, even in the most aggravated forms of fractures of the extremities. For, the remarkable ab-

sence of painful or other distressing symptoms in this individual was, to every one who saw him, a matter of astonishment. I should remark, in this place, that the third fracture, or that near the ankle, was only discovered in the examination of the limb after its removal from the body.

CASE III.—Bartholomew North, *æstat.* 36, admitted on the 13th March, 1834, with fracture of the fibula, about three quarters of an inch above the ankle. The injury was caused by the bending outwards of the joint in wrestling, and was remarkable in exhibiting an extremely sharp projection of the lower fragment, which gave the appearance as if a pointed nail were pressing from within against the integuments, and which rubbed along the surface at every movement of the joint. No degree of pressure had any effect in replacing the fragment; indeed so much pain was produced by the least touch against the projection, that no attempts at replacing or keeping it right by any manipulation of this kind could be made. Steadiness of position, and guarding, at the same time, against any hurtful pressure, by which sloughing of the skin, and conversion of the injury from the state of a simple to that of a compound fracture, were, therefore, the chief indications aimed at in the treatment. There was great swelling and pain, and blackness from extravasation of blood, amounting even to the formation of vesications; but no spasms, as may be observed generally in fractures of the fibula, and as deserves particularly to be noticed in this case on account of its peculiarly complicated character, in illustration of the views taken in a subsequent part of this paper respecting the cause of spasmodic action of the muscles in fractures of the extremities. Day after day we dreaded to find an opening in the skin, which was so thinned as nearly to permit the bone to be seen through it; but we were pleased in observing, that after about a fortnight's apprehensions the prominence became less threatening, and finally sank down, without being attended with farther inconvenience. The joint, however, for six or eight months remained weak, tender, and swollen. In

case No. VI., to be hereafter noticed, wherein there was a like projection of a spiculated bone, a similar escape from the conversion of a simple to a compound fracture, was effected by attention to a particular line of treatment.

CASE IV.—John Probart, æstat. 53, admitted with fracture of the right tibia and fibula, between the lower and middle thirds of the leg, produced by the fall of a heavy piece of timber against the limb. Brought in within an hour. The leg was slightly shortened, and in the ascent of the lower fragment beyond the upper, a piece of skin was tucked in between the bones, so as to give the appearance of a wound in the integuments. By extension the bones admitted of being restored to their natural place, and by the same effort the puckering of the skin was made to disappear; but both these conditions recurred the moment the extension was discontinued. The pressure of the end of the upper fragment against the inner surface of the integuments, in the shortened state of the limb, threatened the production of an opening in that texture, and a consequent conversion of the simple into a compound fracture; and it became necessary, on this account, in the treatment of the case, to exert, from the very onset, permanent extension. This plan of treatment was accordingly at once put in force, and from first to last, the limb never winced from a spasm, the fracture gave no pain, and the inflammation which followed scarcely deserved the name. Moreover, the patient made no complaint of uneasiness from the position which he was obliged so long to maintain, nor of inconvenience from the apparatus of extension applied on his limb. About the end of the third week he was obliged, on account of some family matters, to be removed to his home; and although he accidentally sustained a fall during his absence from hospital, union was accomplished on his return in the ordinary time.

CASE V.—Richard Gaffney, æstat. 18, was admitted into hospital September 5, 1835. On the preceding evening, while wrestling for amusement with a comrade, his leg was twisted in

such a manner that the left tibia and fibula were both broken about two inches above the ankle joint; he suffered greatly during the night from pain, tension, and startings, and when brought into hospital the lower part of the injured limb was much swollen, and the ankle joint appeared filled with blood. Several large purplish vesications had formed over the tumefied part. The pieces of broken bone were in proper *juxta-position*, and the limb had undergone no shortening. The splints and bran-pads were applied on the limb, with a foot-piece to steady the fragments; but the apparatus for extension was omitted, there being no occasion for it as the limb was not shortened; and, fortunately, as the swollen and vesicated state of the ankle offered a complete barrier to its application. Ordered,

Cold lotion, without intermission.

The same position of the limb was maintained throughout the treatment, and with the exception of the primary fever, and pain consequent upon effusion into the ankle joint, not a solitary unpleasant symptom arose. From the secure manner in which the limb was supported in the straight position, the man was enabled to sit up in bed, and even to turn on one or other side, varying his posture at pleasure, so as to obviate fatigue, without any risk of deranging the broken bones. He was discharged on the 23rd of October, complaining only of some stiffness and weakness of the ankle.

CASE VI.—James Cullen, a healthy labouring man, about 50 years of age, admitted March 11th, 1835. A few hours before admission, a cart wheel had passed over his left leg, producing a comminuted fracture of the tibia, and a simple one of the fibula, nearly midway between the knee and the ankle. A portion of bone, about one inch long, was loosened by both its extremities from the centre of the tibia, and so displaced, that the ends were turned in a direction transversely to the long axis of the limb. The sharp point of this displaced fragment projected on the inside, so as to be felt and seen pres-

sing against the skin, which at this spot looked thin and blue, as if certain of being converted by slough or ulceration into a hole, and thereby of transforming the accident from a simple to a compound fracture. The limb was much shortened, and when lifted up in the hands felt like a bag of loose bones. When allowed to lie without the application of any extending force, it was bowed forward by the action of the gastrocnemii, and other flexor muscles. The least disturbance of the limb, or even the motion given by a stop in walking on the floor, caused pain and spasm of the muscles. The case threatened badly. The limb was at once secured immovably in the extended position, in the manner represented in the plate, and as soon as the dressing was completed, the patient began to express his gratitude for the ease which had been given him. For a few nights an opiate was administered, and cloths dipped in cold water were applied to the limb. This patient never, from the application of the first dressing to the completion of the cure, experienced a single spasm, he every morning expressed himself as having had a good night's rest, and when questioned closely on the point, he said that "sometimes on going to sleep, but not always, he was reminded of his broken leg by some trifling sting in the part," which leaves no doubt, that had the limb been left in the flexed position, or unsupported in any position, it would have been harassed by spasms of a much more aggravated nature. The pulse in this man did not at any time undergo the least acceleration, he had no thirst, no furring of the tongue, in short, no fever. Neither did the broken limb become at all swollen, or exhibit any marks of inflammation. So much was this the case, that the man one morning asked me, what perhaps may have been suggested to him by some conversation which he overheard among the pupils about his bed, namely, "was I afraid that there was too little inflammation about his leg to knit the bone?"

The first apparatus and dressings were not, with the exception of a little occasional tightening of the straps, as the leg

shrank, changed for three weeks, when I deemed it necessary to make an examination of the state of the limb ; I then found it exactly as I had placed it in the first instance, and was much pleased to discover that the fracture was still a simple one. The sharp *spiculum*, from the projection of which I apprehended the production of an opening in the skin, had considerably receded, but not without having so far injured the integuments against which it pressed, as to have caused the death of that part, which, however, for about the size of half a sixpence, stuck as a dry scab in the opening which it filled up, and was not detached till the cure was completed. The bones had now altogether lost the crepitus, and there was a considerable degree of firmness about the fracture. The limb was again settled up as before, leaving out the bandages for extension, now no longer necessary, and allowed to remain so without being again disturbed for three weeks more, at the end of which time the union was found so complete, as no longer to require any further artificial support.

Certainly no mode of treatment founded on any other principle than that of setting the fracture at once in the straight position, and keeping it steadily and immoveably so, could possibly, in such an unpromising case, have effected a *more* rapid or perfect cure ; and there is reason to doubt whether any other plan would have been *equally* successful. Any disposition of the limb failing to check the spasmotic action of the muscles, would unquestionably have laid the foundation for a higher degree of fever and inflammatory action, and the almost certain perforation of the skin by the sharp bone which pressed against it, thereby opening up the fracture, and ending, perhaps, in the total exfoliation of that short detached piece, with all the evil consequences attendant thereon.

CASE VII.—James Carleton, *ætat.* 12, admitted on the 8th of October, immediately after the receipt of a fracture of both bones of the left leg, two and a half inches from the ankle. The limb was at once dressed, according to my custom, with

two long splints and corresponding bran pads; inflammation or spasm had not yet set in, and though there were neither internal medicines, nor outward lotions of any kind administered, during the whole period of his stay in the hospital, the union was completed in three weeks, without deformity, and without the occurrence of fever or local pain, or spasm. The only attention here paid was to the proper and steady adjustment of the broken bones.

CASE VIII.—Baines Deane, a workman in a calico factory, 30 years of age, on the evening of the 24th of October, in leaping over a wall, fell and broke both bones of his left leg, a little above the ankle. At a distance from the public road, and unable to make his melancholy condition known to the passengers, he endeavoured to crawl along, dragging his broken limb after, until at length, wearied and in pain, he was obliged to lie down in the open field, and, without hat or other outward covering, to bear the inclemency of a cold and rainy night. When discovered in the morning, and brought to hospital, he was shivering and feverish, and the leg and thigh were greatly swollen and livid; there was also considerable effusion into the cavities of the knee and ankle joints; and the spasms, which were frequent and severe, gave him much annoyance. About fifteen hours elapsed before the limb could be dressed. The leg was then placed in the straight posture, supported by splints and pads. In the course of the evening, the fever and the tension of the limb became so urgent as to require the abstraction of blood from the arm, and the administration of an active purge. On the following day, large vesications had formed all about the fracture, and in the course of twenty-four hours more, nearly all the cuticle from the knee to the ankle was detached, in some places with a subjacent effusion of yellow, in others of blackish serum. The vesications were punctured with a lancet, and the fluid squeezed out, but care was taken that no part of the cuticle should be detached: the limb was well supported, so as not to yield to any spasmodic action of the muscles; and

antimonials and cooling lotions were assiduously administered. After a few days, when the fever and local inflammation had abated, the cold was discontinued, and the vesicated part of the limb enveloped in lint smeared with ointment, to prevent the drying of the cuticle, and the contraction of any adhesion between it, and the surrounding bandages. The advantage of this treatment soon became manifest, for the patient made no complaint of any suffering except that arising from the pre-existing fever and inflammation. The cuticle served as the most appropriate application to the denuded cutis, which dried up; and formed new scarf-skin, as in the case of a blister, without the formation of a drop of purulent matter, a result which I scarcely anticipated, as in the generality of such cases which I have witnessed, abrasions of the cuticle have been followed by tedious superficial excoriations and ulcers, which embarrass the the case, by giving rise to the necessity for a more frequent removal of the splints than is convenient or salutary. The union (November 25th) is already nearly completed, and the man promises to be cured in the ordinary time required for the reparation of a broken leg.

CASE IX.—James Toole, *æstat.* 38, was admitted July 11th, 1833, for a fracture of the right femur, about two and a half inches above the knee, caused by a heavy beam of timber falling against the thigh. The accident had occurred about six hours before admission, and the man had been carried for a distance of seven miles. The knee-joint became greatly swollen before the expiration of twelve hours, evidently from synovial effusion, as the patella was much elevated from the joint, and when pressed on with the fingers, sank back, so as to strike with an audible noise against the condyles of the femur. There was, however, no feeling of pain produced by this experiment, neither was the joint red, nor impressed with any of the other symptoms of acute inflammation. The symptomatic fever was also of such a character as to contra-indicate the presence of inflammatory action in the part. The limb was placed on the

double-inclined plane, and wetted with cold lotions. In the course of forty-eight hours a swelling formed along the outside of the thigh, extending from the knee to the trochanter. The patient could not bear the limb to be touched, and he was deprived of rest by distressing spasms which tormented him on every occasion of going to sleep. The tumour of the thigh increased rapidly, and threatened suppuration, which was, however, arrested by leeches, stupes, and antimonials. At the end of a fortnight, when the inflammation of the thigh had been subdued, and when the swelling of the knee had subsided, the limb was placed in the straight posture, and Desault's splints applied, gradually, from day to day, increasing the extending force, until the limb was brought to the same length as its fellow. Considerable complaint was made by the patient, of the inconvenience experienced from the lacs employed in making extension; but, as no excoriation followed their application, they were persevered in, until at length the relaxation of the extension ceased to be followed by shortening. Between the seventh and eighth week the union was complete, and in ten weeks the man was discharged, well in every respect, except as concerned the knee joint, the ligaments and other connecting textures of which were so unusually relaxed, as to allow of the tibia being bent on the femur in every direction. The joint was so weak and flexible as not to be able, without the aid of a knee cap or bandage, to support the weight of the body; and it was not before the expiration of twelve months that it regained its wonted strength. By this time, however, the man was completely well, and his limbs were of equal length.

This case is instructive in many respects. It teaches us that the treatment by the double-inclined plane will not prevent spasms, and that this apparatus does not act as an extending power; also, that there may be great effusion into a joint, independent of injury or inflammation of its cavity; and further, that at so late a period as a fortnight, it is possible to elongate a limb shortened by overlapping of the fragments. The

elongated and relaxed state of the ligaments of the knee was, no doubt, the result of the long-continued forcible extension.

CASE X. —— M'Auley, ætat. 45, addicted to frequent excesses in drinking, was admitted into hospital on the 22nd. of April, 1834, with a fracture of the middle of the left thigh, the consequence of a fall. The limb was placed on a double-inclined plane of the most approved construction, and the utmost pains taken to preserve it in a proper and steady position. There was considerable swelling and painful starting of the limb for several days. These symptoms, however, all subsided, but the patient remained restless and uneasy, and was much dissatisfied with his position. At the expiration of a month there was no sign of union, and even six weeks elapsed without any apparent advance being made towards a consolidation of the fragments, although the man did not exhibit any indications of derangement in his general health.

The limb was now placed in the extended position; strong adhesive plaster was applied round the broken part, and some blue pill administered. A fortnight more elapsed, and still the broken pieces admitted of motion on each other. At this period a new and unexpected affection showed itself, namely, delirium tremens, in a paroxysm of which the man pulled off the splints, and leaped out of bed. In the effort at standing the limb yielded to the weight of the body, and was a second time completely bent at the fractured part. Having recovered from the delirium, the patient was removed to his own residence for change of air, and there, when he began to hobble about on stilts, having the thigh well braced with plaster and bandages, the union of the fracture was after a few months accomplished.

The failure in the process of union was not, here, for want of a proper apposition in the fragments of the bones, for the natural length and shape of the limb was not deranged; I conceive it to have been the result of the preference given in this case to the plan of treatment by the double-inclined plane, over that wherein the extended posture and straight splints are had re-

course to. The grounds on which this opinion is founded are stated at a subsequent page.

The supervention of that affection, marked by all the symptoms which characterize the delirium of drunkards, and relieved by the treatment appropriate thereto, at so late a period as eight weeks from the time at which the man had totally given up the use of ardent liquors, and during all which he had never manifested any longing for indulgence in his favourite beverage, is, I believe, an unusual occurrence; and, that the affection under which this man laboured was none other than that just stated, may be gathered from the fact that he had previously had more than one attack of a similar nature, brought on by excesses in the use of ardent spirits. It is certain, however, that while in the hospital he had no opportunity of being supplied with such potations.

CASE XI.—Patrick O'Hara, *scat.* 5, an extremely handsome, chubby boy, and born of healthy parents of large stature, was brought into hospital on the 14th of January, 1834, with fracture of the left tibia, produced by a fall, in running to escape from a dog which frightened him. His mother stated that the opposite leg had been broken in the same place, and from an equally trifling cause, about nine months before, and examination proved the truth of her statement, for, not only had it been broken, but bore evidence of a bad job in the reparation. The recent fracture became united, and the patient was dismissed from hospital by the end of the third week.

On the 26th of November, in the same year, he was brought back by his mother, in equally apparent good health, with a fracture of the middle of the right thigh bone, caused by a fall of the same simple description as in the former instance. From this accident he recovered as expeditiously and as completely as from that of the tibia, and went home well. But we were not a little surprised to see him again conveyed to the hospital on the 13th of August in the following year, labouring under a fracture of the only remaining unbroken long bone of his lower

extremities, the right femur. From this he, in like manner, had a complete convalescence, and is at this moment, only in his sixth year, in as good apparent health, and of as full and perfect growth, as any boy of his age. There is certainly nothing of *mollities ossium* in his frame, his bones being all straight and his joints fine; and that *fragilitas*, if it be such, should be present at so juvenile an age, is, I believe, a condition of bones which may fairly be placed among the "cases rares." It would appear, that in the reparation of the fractures, the bones acquired increase of strength; for whilst the lesions have taken the round of all the long bones of the inferior extremities, in none of them has it as yet occurred a second time. I give this case as a rare one, rather than that I consider it bearing on the conclusions to which it is the object of this paper to arrive.

CASE XII.—Ellen Kenny, ætat. 13, was admitted on the 17th June, 1835, with fracture of the right thigh, close beneath the lesser trochanter. Two days had elapsed before she was brought to hospital, and during this time she had been allowed to lie on the side, with the limb in the flexed position: No other mechanical means had been used to bring the bones into apposition, or to preserve them against being moved by the action of the muscles: the girl had in consequence suffered much from spasm; the limb was swollen to more than double its natural size; vesications had also formed on several parts of the skin, and there was severe symptomatic fever. The upper fragment, as is usual in fracture of this part, projected much forward, and gave to the thigh a curved appearance. The same position as that in which she had lain before admission was persevered in, and under the use of refrigerating applications, a considerable reduction of the inflammation was effected by the end of the fifth day from the occurrence of the accident; but, nevertheless, during all this period, a night-nurse was obliged to sit by the bed-side, with her hand on the

broken limb, which, otherwise, on every attempt to sleep, awoke the patient with a spasm. On the morning of the sixth day she was turned on the back ; the broken limb was pulled to the same length as the sound one ; permanent extension was kept up by Desault's splint, applied on the outside ; a corresponding long splint was placed along the inside, and a short one was laid on the front, so as to make pressure on the projecting end of the broken bone : long pads of bran were interposed between these and the limb, and the whole secured together by broad straps and buckles, in such a manner that the limb was subjected, on every part, to moderate and uniform pressure. The business of altering the position of the patient, and of setting the fracture, was productive of much pain, and no doubt had the operation been practised in the first instance, not only would the amount of suffering caused by it have been comparatively trifling, but most probably the distressing spasms, and inflammatory swelling, borne during the first five days, might have been averted ; for, from the moment in which the limb was settled, as has been just described, all tendency to deranged action of the muscles ceased, the girl slept soundly, and the tumefaction rapidly subsided ; she expressed herself as much more comfortable in her new than in her old position, and got well rapidly, without any farther untoward symptom. She walked out of the hospital on the 20th of August, without any appreciable difference, as to shape or length, between the unbroken and mended limb.

The treatment, by permanent extension, of fractures of the femur, close to the trochanter, is not, it will be observed, that which is usually practised in such cases ; but it was here most completely successful, and I might state other instances in which I have adopted it with equal effect. I might also mention cases of a similar kind, in which the plan of keeping the limb in a state of complete flexure, all through the period of healing, was followed by an opposite result.

CASES XIII—XIV. Two sailors, Frederick Whitney, and

William Rochford, about the same age, nineteen or twenty, were brought into hospital within a day of each other, in the month of August, 1834. They had both fallen from a height, in different ships, and had injured, one the right, the other the left elbow. On examination, it was clearly ascertained that the injury in one consisted simply of a fracture of the humerus; about an inch and a half above the joint; and that in the other, in addition to the same injury of the bone, a perpendicular fracture extended from the transverse one into the elbow joint. In the former case there was not much of local inflammation, nor constitutional disturbance; in the latter, the patient had shivering, paleness, coldness of the feet, and vomiting, immediately after the accident. The arm, and forearm also, became much swelled, and there was great effusion into the joint; but in neither instance were there any spasms.

In the former case, cold applications were found most appropriate; whilst in the latter, warm stupes gave most ease to the patient; but after the local inflammation had subsided, they were both treated alike, with the arm in the semi-flexed position. The result was, that they both got well about the same time, and with an equally perfect use of the elbow joints.

These cases have been all selected from among patients under my own immediate care in the hospital. Many others, of equal interest, have passed through the hands of my colleagues.

Amongst the symptoms arising out of fractures of the extremities, disturbing, in a marked degree, the patient, and demanding the attention of the surgeon, are *spasms* of the muscles of the injured limb. The time of accession of this distressing symptom is liable to some variety, but generally it appears in a few hours. It is most severely felt when the patient is falling asleep, causing him to start in a fright, deranging the broken fragments, and producing great pain. The least movement of the bed, or even the step of a by-stander on the floor, will often be productive of the same effect. The period of the

duration of spasms is not in all cases the same ; they usually cease about the sixth or seventh day, but sometimes go on for a greater length of time. A case has been communicated to me by Mr. Cusack, in which they were extremely severe, and terminated on the sixth day, in the production of general tetanus, of which the patient lost his life. Spasms are usually most severe when the inflammatory action runs high ; and this latter is no doubt aggravated by their presence.

The occurrence of spasms in a fractured limb would appear to be independent of any injury which the soft parts may have sustained from the accident. The largest flesh wounds are exempt from spasms ; whilst the simplest forms of complete fractures, those freest from lesion of the surrounding soft textures, are as liable as any others to be attended by this symptom. A spasmodic condition of all the muscles of a limb sometimes, it is true, follows a trifling wound of the flesh uncomplicated with fracture of the bone, but this is a peculiar disease, not admitting of a comparison with that irregular spasmodic action usually attendant on fractures of the long bones of the extremities, nor relievable by the same means.

The spasmodic contractions of the muscles surrounding a broken bone, appear to be wholly the result of the unusual condition into which these organs are thrown by the withdrawal of the customary support which they had received from the bone, in its unimpaired state, aggravated perhaps, in some instances, by the irritation of the spiculated fragments. But, that the former circumstance is more concerned in their production than the latter may be considered proved by the fact, that there are abundant instances of fractures, wherein the limb has been harassed by spasms, without the presence of any spiculated points to irritate the muscles ; whilst there are others, equally numerous, in which, the main bone for the support of the limb remaining entire, the presence of numerous sharp fragments, whether of bone or of substances equally irritating, has excited no such diseased action. Pointed spicula may, in a case where the long bones are broken, aggravate the spasms

attendant thereon, but except with such complication, they appear to have no power of originating spasmoidic contractions.

An application of the laws which regulate the actions of the voluntary muscles, to the circumstances in which these organs are placed in the case of fracture of the bone on which they depend for support and fulcrumage, supplies an easy solution of the cause of their unnatural contractions under such circumstances, and points to the right method of prevention.

The actions of the voluntary muscles are principally regulated by the will; the will, nevertheless, can only exert its influence upon them as long as the fulcra and levers, by which the natural movements of the limbs are accomplished, remain in perfect order. Let any of these levers be broken, as occurs in fracture of the tibia, or let the fulcrum at the upper end of this bone be altered, as by its dislocation from the femur, and the whole power of the will over the motions of the limb is destroyed. But this is not all: the muscles which retain unimpaired, their contractile powers, are, by the fracture or dislocation, thrown into a completely new predicament; a predicament by which the usual fixtures of their extremities are loosened or changed, and by which, in many instances, their extremities are brought nearer to each other. The effect of such a change on these excitable organs, is to induce in them a perpetual tendency to contraction, and which will only cease when they have been restored to their original position, and furnished with their natural points of resistance, or after having been for some time accustomed to their new state. Then, only, it is, that the will will regain its natural ascendancy over them, and the tendency to morbid action subside. That involuntary spasmoidic action will be excited in muscles, by cutting off or loosening one or other of their fixed attachments, is shown by a variety of facts; and, among others, as the most applicable in illustration of the present case, may be mentioned the instances of spasms so commonly witnessed in the muscles of stumps recently after amputation. Here the contractions are of the same character,

and generated by the same temporary exciting causes, such as motion of the limb, or desiring asleep, as those attendant on fractures of the bones of the same member; and yet, in this case, there are no irritating spicula to account for their production.

I have mentioned the case of dislocation as a parallel instance to that of fracture, in producing an alteration in the relative position of the bones and muscles to each other, and thereby depriving the will of its power over the actions of the latter. But in this case it is not usual for the muscles to fall into a spasmotic state; and why? certainly, not because the tendency to such action does not exist, but, simply, because it is prevented coming into operation by the fixed and immovable condition of the bones, resisting any further shortening of their fibres. Even in fractures of the extremities, circumstanced in this respect like dislocations, viz. where the broken bone is mechanically prevented from bending under the action of the muscles, as, for instance, in fractures of broad surfaces near joints, such as the condyles of the tibia or femur, or of the lower end of the humerus, (see Cases XIII. XIV); fractures near the trunk of the body, where the weight and length of the limb prevents its being turned to one side or other by such agency, as—in the case of the neck of the thigh bone or humerus; or in fractures of the extreme parts of the limbs, where one of the bones remains unbroken, to act as a resisting splint in support of the other, as in fractures of one of the bones of leg or forearm, (Case III), we scarcely ever hear patients complain of startings in the injured limb. Neither do we find that in similar injuries of the skull, pelvis, (see the case of John Fortune in the last number of this Journal), ribs, or sternum, any such symptoms ever follow in their train, no matter how comminuted or spiculated. The reason of the absence of this symptom in all such cases is, without doubt, independent of any peculiarity in the lesion of the bone, and solely attributable to the intervention of some mechanical support enjoyed by

the muscles, which has escaped unimpaired, notwithstanding the lesion of the bone, and which, by maintaining the tendons at fixed distances, thereby prevents the muscles from falling into spasmodic action. Partial support, or that which allows of a degree of motion in the broken bone under the action of the muscles, but which brings back the limb, after the contraction has ceased, to the same point at which the spasmodic action was generated, and thereby places it in a predicament to induce a repetition of the diseased motion, and to be again bent in the same direction, would appear to be worse as regards spasms, than no support at all. Thus, in fracture of the bones of the leg, where the weight of the foot, or the action of the extensors, restores, to a certain degree, the bones after having been bent during the spasm by the flexor muscles, a repetition of this spasmodic action will be sure to occur on the least revival of the excitement; whereas, in fractures of the patella or olecranon, and, perhaps, also of the os calcis, the loosened tendon of the appertaining muscle being drawn by a permanent state of contraction nearer its fixed extremity, the occurrence of such spasmodic exacerbations is seldom to be witnessed.

With these facts so fully established, namely, that no degree of injury unless accompanied by a fracture of a bone, is followed by spasms of the muscles, of the kind here alluded to—that no fractures of the bones in the body, except those of the extremities, give rise to those spasms—and that, even in the case of the extremities, if the broken fragments be naturally so circumstanced as not to admit of derangement from the action of muscles, there will be a complete exemption from unnatural spasmodic action, an obvious practical conclusion suggests itself, namely, that by imitating artificially the condition adverse to the development of spasms in either of these cases; viz. by restoring the broken fragments to their original places, and retaining them immovably in that predicament, avoiding at the same time all hurtful pressure, a similar exemption from this harassing symptom may be obtained. Such anticipations are very plausible in

theory, and will, I believe, if the experiment is properly made, be generally realized in practice. The cases above cited afford several illustrations, not only of the possibility of preventing, by such means, the occurrence of spasms in fractures which otherwise would be liable to them, but also of putting a sudden check to their continuance after having fully set in. In Case VII., admitted half an hour after the accident, and placed into proper position on the instant, no spasms whatever occurred, although not so much as a cooling wash was brought to the assistance of the mechanical means employed; in Cases V. and VIII. the spasms which had commenced were instantly checked, even during the presence of high inflammation, by the security given to the limbs against motion; and in Cases I. and II.—bad compound fractures—the spasms were suppressed as long as the dressings were kept steadily on the limb, but showed themselves on the instant of their removal. There are cases, I admit, for I have seen such, in which it may be found impossible to bring the broken ends of the bone into apposition, and in which the means efficacious in obviating spasms under circumstances where no such complication exists, would fail in producing the same result; but such occurrences tend rather to establish my position than to subvert it, for if the fragments do not admit of being brought together, natural support cannot be provided for the muscles, and a continuation of the spasms may be expected. The case already alluded to, in which the spasms ran into general tetanus, was of this description. The protrusion of the bone into or through the muscles in its vicinity, is one of those conditions which, more than any other, militates against the replacement of the fracture. Mr. Cuseack informs me that he has seen several such cases in which reduction could not, by any force or manœuvre, be accomplished, and in which the spasms were of the most aggravated description.

Intimately connected with the phenomena of spasms is the *pain* experienced by patients disabled by fractures of the extremities. Accidents of this nature often occur, in which, from

the receipt of the injury to the period of its reparation, little or no sensation of pain is felt in the injured part; but, in such cases, it may be taken as a pretty general rule that there have been no spasms of the muscles. The treatment which had averted the one has contributed to the relief of the other. Pain is an essential concomitant of spasm in fractures, and the pain from this cause is the most distressing of any which such patients have occasion to complain of. The mere solution of continuity in a bone is not, in itself, necessarily attended with pain, for a limb is often broken without the individual being apprized of it at the moment, by the occurrence of any painful feeling, and the first intelligence which he receives of the precise nature of the injury may be learned from his inability to stand. The pain, then, attendant on the first stages of fractures may, like the spasms, be looked upon as a non-essential symptom of lesion in the bone, and, like that phenomenon, more or less relievable by treatment directed properly to the particular circumstances on which its presence depends. I have a notion that any pain experienced in simple fractures, except that attendant on excessive inflammation, is relievable by the same means as those which succeed in averting or removing spasms, and I always suspect, when a patient complains of much uneasiness after the fracture has been set, that the dressings misfit him in some way. In Case VII., which was settled up in straight pads and splints immediately after the accident, no pain was felt at any period during the treatment, and in all the cases managed in the same way, but in which the treatment was not undertaken until after pain had seized on the limb, the patients got almost instant relief by the dressings.

The *local inflammation* and *general fever* attendant on such accidents vary extremely in different instances, and are less under the control of treatment than either of the two preceding symptoms. In a simple fracture, that kind of attention which is successful in obviating spasms and other painful feelings will, no doubt, contribute much towards averting any excess of in-

inflammatory action which the irritation produced by them must, otherwise, necessarily create. And, even in a case of comminuted fracture, when not much complicated by injury of the soft parts, if the limb be duly supported and maintained in a sufficiently easy posture to avert spasm and pain, it is possible for the patient to escape without inflammation or fever sufficient to deserve the name—a fact which is well illustrated by the case of Cullen, No. VI. There are, however, numerous collateral causes which may bring on severe inflammatory and febrile symptoms; such as severe injury to the soft parts, motion of the broken limb after the accident, exposure to cold, &c., and, in the treatment of which, the surgeon must bring to his aid the usual means resorted to in ordinary inflammatory affections. He will find, however, that the methods most successful in relieving spasms and pain in the more simple cases will be equally available, for the same purposes, even in such complicated accidents as these. Witness the good effects of combining the mechanical with the medicinal parts of the treatment in Cases I. II. VIII. X., &c.

These cases and observations being premised, I proceed to apply them to the consideration of the treatment of fractures generally; and in particular to the question of the relative advantages of one kind of practice over another. They will, I hope, assist in leading us towards a conclusion as to what is the best mode of preventing early spasms, pain, and fever, and of securing for the patient, after the cure, the most seemly and useful condition of limb—whether that of leaving the broken bone, during the first days, in the predicament in which it has been thrown by the accident, or that of bringing about, and securing, by artificial means, the proper apposition of the fragments, is the more likely to accomplish these objects. They may also enable us to draw a comparison between the advantages of the flexed and straight postures in the treatment of such accidents.

It appears to me that no advantage whatever is gained by leaving the ends of a broken bone in any manner out of place, whilst it can be clearly shown that such derangement is, in many

respects, injurious. The excuse for this practice, founded on the doctrine of relaxing the muscles to prevent or relieve spasms, is conceived in error. For, independently of the just and oft-repeated argument, that in the act of relaxing one set of muscles for the purpose of obviating such an inconvenience, the antagonists of these muscles are thrown into that very condition, viz. a state of extension, which, it must be presumed, by holding to the same argument, promotes spasmodic action, it is a fact that relaxation of the muscles, having a tendency to spasmodic contraction, excites and promotes such contraction; whilst, on the other hand, extension or stretching of the same muscles will be found the most likely means of averting the spasm, or of subduing it when the action has taken place. It is, for instance, known to the experience of every one that in the spasmodic action of the gastrocnemius, which follows over-exertion of that muscle, relief is sought in an attempt at elongating the muscular fibres by stretching out the heel, and not, in encouraging their contraction, by pointing downwards the toes. A person, in bed, seized with such cramps, will, instinctively, press the heel of the affected limb against the foot-board, or get out of bed, in order more effectually to accomplish the same object, by standing with the heel on the ground. In this case it is obvious that relaxation of the muscle is favourable to the occurrence of spasm, and that extension constitutes a means of relieving it from that state.

The primary cause of spasms of the muscles in fractures appears to be the loosening of one or other of their fixed points of attachment, and it is not likely that by leaving them in the loosened state, or by giving one set of the muscles a greater degree of relaxation than another, such as is given to the flexors by bending the limb in their favour, a check will be given to irregularity in their movements. On the contrary, it would appear, both from an examination into the laws of muscular contraction, and from observations of the phenomena which occur in other cases of disease as well in fractures, that the more

completely the muscles are extended in length, and secured by their extremities to unyielding points, the less will be their disposition to spasmotic action. A striking illustration of this point lately occurred in our hospital under the care of Doctor Benson.

A young woman, labouring under white swelling, with ulceration of the cartilages of the knee, but in whom the joint was to a certain extent very moveable, on account of a relaxed state of the ligaments, and effusion into the cavity, became affected with the most excruciating spasms of the limb, accompanied with pain, which forced from her heart-rending screams. The flexor muscles appeared to be those most engaged in the spasms, as the knee, on every occasion of starting, was raised in a bent direction from the bed. She suffered in this way for nearly three weeks, during which sleep scarcely ever closed her eyes, even under the fullest doses of opium; for notwithstanding the soporiferous influence of this medicine, she was continually roused at the instant of slumbering by a violent spasm of the limb. Neither had local bleeding, counter-irritation, or the application of anodyne liniments, the least effect in appeasing her sufferings. Under these circumstances it was determined to try the experiment of treating the case as one of fracture attended with spasms. A tailed bandage was accordingly applied around the knee with uniform and moderate pressure, and long bran-pads and splints were so adjusted as to prevent the possibility of any motion in the joint or limb; abstaining at the same time from all other medicinal treatment. The practice was most successful; for, from the instant of its adoption, the spasms completely subsided, and all pain ceased. Under a continuance of this plan the patient lay contented and at ease, until ankylosis of the joint was accomplished.

That the relief obtained in this instance was solely the result of the mechanical resistance and support given to the muscles, is proved by the circumstance, that on every occasion of removing the splints, the trembling, spasms, and pain of the limb,

returned with equal violence as before, and continued until the re-adjustment of the artificial support, as was noticed to have occurred in Case I. of fracture of the bones of the leg.

Connected with the question of the relaxation or extension of muscles, as encouraging or preventing spasmodic action in their fibres, is a point which should not be lost sight of in the investigation—namely, the great increase of facility for contraction given to the flexor muscles by bending, or, as it is termed, relaxing the limb, and the proportionate abstraction from the power of the extensors which attends on such posture: for, it is a well known principle in the mechanism of the limbs, that the more the bones approach to the side of flexion, the greater becomes the power and facility of the muscles to move them in that direction, and that the power in the extensors of resisting such contractions are weakened in the same proportion. The power of the flexors, on the levers which they move, is at the minimum in the extreme of extension, and at the maximum in the extreme of flexion; whilst that of the extensors, on their levers, is at the minimum in the extreme of flexion, and at the maximum in the extreme of extension. The practice, then, of placing a broken limb in the bent posture is not that which—reasoning on the nature of the muscles, or their relation to the levers which they move—we should expect to be most successful in averting or checking spasms, for by such posture the most powerful set of muscles, the flexors, are brought into a predicament not only exciting to, but favouring the energy of their contraction; whilst the less powerful, their antagonists, are brought, thereby, to a state in which their influence, in counteracting the effects of such contractions, is nearly in the same degree weakened. And, of the correctness of this reasoning, we may find a corroboration in the fact, that the distortions from spasm, which occur in such cases are almost always to the side of the flexor muscles.

Moderate, soft pressure on the surface of a fractured limb appears to assist in the prevention of cramps in the long muscles,

on the same principle that proper fixtures for the attachment of their distal extremities contributes to that effect. Such pressure may exert its beneficial influence, in controlling any irregularity of action in the muscles, by numbing their sensibility, and producing in them a certain amount of fatigue which weakens their powers of contraction, as well as by propping together and keeping steady the broken fragments of the bone. And, is it not much better, if the object can be gained by such means, to adopt them in preference to the practice in common use of employing a nurse-tender to sit by the patient, with authority to check the painful startings caused by the spasms of the muscles, by pressing with her hand on the injured limb? The uniformly good effect which attends on, and leads to the frequent adoption of this last-mentioned device, may, in itself, be regarded as an argument in favour of the value of mechanical interference in such cases, and should lead to the contrivance of some less expensive, and more trustworthy plan of accomplishing the object.

Such being my views respecting the physiology of muscular action, as applied to fractures of the extremities, and such my experience of a practice founded in accordance therewith, I need scarcely say that I concur fully in opinion with the advocates of the extended posture, accompanied, if necessary, with extension. Several of the cases which I have given, and others which I might add, show the efficacy of this practice in preventing the occurrence of spasms, inflammation, and fever; and others go to prove its utility even when circumstances have prevented its adoption until after the occurrence of these symptoms. In the former, no such consequences followed at all, even under the most threatening conditions; in the latter, they were either altogether checked, or very much mitigated in severity, from the moment of its application; and, in all, the final result was most satisfactory.

The apprehensions entertained regarding the prejudicial effects attendant on forcible extension, such as pain, excoriation,

sloughing, &c. of the integuments, I have never seen realized in practice. The apparatus of Desault, modified, as described hereafter, and represented in the plate, I have employed, over and over again, without its being productive of inconvenience in any of the cases, except in that of Toole, No. IX., in whom the extension, although applied so forcibly as to give rise to relaxation of the ligaments of the knee, was kept up for weeks without the least abrasion of the skin.

But, in addition to these advantages, connected with the extended position in the treatment of fractures of the lower extremities, the adoption of this plan is beneficial in other important respects. The patient becomes sooner reconciled to the bed in this posture than in the flexed one; he can be shifted more readily, so as to vary the points of contact between his body and the bed, and thereby save himself from excoriations or sloughing of any part; he can assume the sitting posture, and maintain it, with less of fatigue, for a considerable time. A better judgment may be formed of the length and shape of the broken limb, by its admitting of a comparison with the sound one; the limb can be kept more steady; and extension, if necessary, can be more readily and effectually practised.

Many advantages attend on an early and perfect coaptation of the broken fragments. The patient will experience much less pain from the operation of setting, in the first moments after the accident, than at any subsequent period; and, if we are privileged to form a conclusion from a single case, it is obvious, from the success attending the practice in that of Woods, No. I., that we need not be apprehensive of damage from the exercise of a very considerable force, should it be found necessary towards the accomplishment of this object. By leaving the fragments out of their proper place for any number of days, the morbid sensibility, generated in the periosteum by the super-vention of inflammation, aggravates the sufferings attendant on the operation of re-setting, and the tendency to spasmodic action in the muscles, which had, perhaps, somewhat subsided by

the habitude which these organs had acquired in their new position, is, by the second change, kindled anew into action. The extremely sensitive state of the periosteum, under such circumstances, was well shown in the case of M'Carthy, No. II., in whom amputation was performed for a compound fracture fourteen days after the accident. This man, though he went through the whole operation without uttering a complaint, could not refrain from screaming when the periosteum came to be scraped off the tibia, which was done with a view of sawing away the anterior projecting angle of that bone, to prevent after-protrusion of it through the skin on the stump. And that severe spasmodic action will also be the result of every attempt at extending a fractured limb, after having lain for any time in the flexed position, is a fact so generally known as to require no particular case for its illustration. But nevertheless, even with the certainty of giving rise to temporary suffering of this kind, I would not be deterred from the operation, having often found, even after spasms, pain, and high inflammation had set in, by bringing the broken fragments properly together, and placing them so that no motion could take place between them, that a check has been given to the cramps of the muscles, and relief from pain procured. The momentary suffering caused by such a procedure will be amply repaid by the subsequent ease, and good final result.—See Cases I. II. VIII. XII., &c.

The *double-inclined plane*, the apparatus in most common use for the treatment of fractures of the lower extremities, does not appear to me exempted, in any considerable degree, from the ordinary inconveniences attendant on any other plan of treatment which has for its object the principle of relaxation or flexure of the limb, whilst it is almost totally useless as a means either of effecting elongation of a shortened bone, or of giving, in many cases, steady support to the member. Besides, it throws the weight of the body so completely on one part of the buttock, and by its bulk and shape so deprives the patient of the means of relieving himself from such injurious pressure,

that excoriation and sloughing of the hips are frequent consequences of its use.

In fractures of the tibia and fibula, I can scarcely conceive a case in which all the indications of treatment would not be more completely fulfilled by the straight posture, with soft, lateral pads and splints, by which the bones can be retained steadily in apposition—extension, if necessary, applied—spasms of the muscles prevented—the limb and body shifted about, or even turned for a time on the side—and a proper measurement of the limb be made, than by the inclined plane, under the use of which fixed extension cannot, to any amount, be exerted, nor that position of the muscles established by which their tendency to spasmody action is subdued, which confines the body in a fixed, uneasy posture, and takes out of the hands of the surgeon the means of judging of the accuracy of adjustment in the fractured bones. For, respecting the powers of extension and counter-extension attributed to the inclined plane in fractures of the leg, there can be no doubt that they have been over-stated, both as regards the influence of the weight of the foot acting upon the knee when bent over the middle elevation of the plane, and as regards the resistance which that elevation gives, in case the foot be pulled downwards to any resisting object; for, it is the fact, that in the former case the suspension of the foot is not such as to make it act by its weight in producing extension; and that, in the latter, the least effort of the patient—no matter how well the apparatus be adjusted—will advance the knee in front of the elevated angle, and thereby nullify the resistance which it is supposed to offer against the extending force applied at the foot. Any attempts, therefore, at extension by means of the inclined plane are not, in such cases, to be fully relied upon.

In the treatment of fractures of the thigh, the objections to the inclined plane are even more numerous; for, in addition to those urged against its applicability to injuries of the bones below the knee, there is one, which only requires to be mentioned to

have its force recognized, namely, the absence of any provision in its construction by which the upper fragment may be steadied against the lower, especially in cases where the lesion in the bone has taken place near the trochanters. The lower piece, together with the knee and leg, are immovably fixed, whilst the upper is left in such a predicament that the least movement of the buttocks bends it from side to side, and rubs and twists its broken surface against that from which it has been detached, and with which it is the chief object of the treatment to keep it in steady apposition. There is no provision in the inclined plane by which the upper part of the thigh, when bent upon the pelvis, can be secured against the motions communicated to it by that part, such as may be effected in the extended posture by long splints and pads, passing up on the inside close to the perineum, and on the outside as far along the body as may be thought necessary, securing, thereby, all the parts, so that in any movement which is made, all must go together, as if they were one solid piece. The failure in the process of union, which occurred in the case of M'Auley, No. X., I attribute solely to this ground of imperfection in the inclined plane—the apparatus used in his case. The usual objections to the adoption of the straight posture in fractures below the trochanters, on account of the tendency in the upper fragment to be pulled forwards by the psoas and iliacus muscles, are not of universal application; as I have given a case, that of Kenny, No. XII., in which, under this plan, no more difficulty attended the treatment, and no more deformity remained after the cure, than in fractures of any other part of the bone. The projection forwards of the upper piece, so remarkable in the first days after the accident, gradually subsided, under gentle pressure on the forepart of the thigh, and the bones finally assumed their natural points of connexion with each other. By the adoption of the extended posture, with the aid of extension, that deformity, so common in fractures of the thigh—permanent eversion of the toes,—and, I believe, also, that of shortening of the limb,—will

be more probably averted, than can be done under the best directed efforts of the double-inclined plane. By the same plan, likewise, an inconvenience, of which patients often complain bitterly, viz. pain and excoriation of the heel, may, with the aid of a narrow pad between the limb and the bed, a little above the heel, be easily obviated.

These observations are not, in any degree, meant to apply to fractures of the neck of the thigh bone, in which, the possibility of osseous union being very remote, if not altogether questionable, the less of constraint put upon the patient or his limb, so much the better.

Respecting the failure of union, which is observed to occur occasionally in fractures of the bones, I am inclined to believe that our knowledge of its cause is very unsatisfactory. The doctrine that want of inflammatory action will be attended with a corresponding imperfection in the secretion of callus, is far from being well established; for, if ever there was a case exhibiting complete absence of all the symptoms indicative of inflammation, it was that of Cullen, Case VI., in whom, from the receipt of the injury to its final cure, neither pain, nor swelling, nor cramps, nor fever, at any time showed themselves: and, nevertheless, in this man the bones, though badly comminuted, became united in the ordinary course. In a case, the preparation of which was presented, by Professor Kirby, to the Museum of the College of Surgeons, I have met with a singular illustration of this point. An old woman, from a fall, sustained a fracture of the thigh bone, and after lying in hospital for several months, without having had much occasion to complain of suffering, the leg was surrounded by adhesive plaster, and she became enabled to walk about by the aid of crutches. She did not, however, long survive her convalescence, and upon examination of the limb after death, it was discovered, that, in addition to a transverse fracture of the middle of the thigh, a perpendicular one, four inches in length, ran up to the trochanter. The transverse lesion exhibited a perfect false joint, with

fibrous capsule, and synovial membrane, whilst the portion detached by the perpendicular fracture had become firmly and universally united to the original bone, in a manner which showed that the union must have been accomplished in a very short period from the receipt of the injury. The explanation usually given of the cause of such a failure, want of sufficient action, will not hold good in this case, as the action was fully competent to the reparation of the lateral fracture, though it failed in the transverse one. Want of proper apposition, and the frequent occurrence of motion between the two main pieces of the bones, were, more probably, the causes of non-union at this part. In my own case, that of M'Auley, No. X., I have no doubt that such was the cause of the want of union. Professor Kirby has also stated to me an instance of a middle-aged man, in whom almost every long bone of the body had been broken, at one time or other, from trifling causes, but, notwithstanding what might be called, in this case, great weakness of the system, all these accidents were repaired with very little suffering, and in a moderately short space of time.

Neither does an excess of healthy inflammation appear to militate in many cases against the formation of healthy callus. In illustration of this circumstance, reference may be made to the case of Deane, No. VIII., in whom, although the inflammation and fever ran so high as to require active depletion, yet, nevertheless, the process of reparation was not retarded or rendered imperfect.

The apparatus which I am in the habit of using for the treatment of fractures of the lower extremities, in adaptation to the principles here laid down, is extremely simple and cheap. A representation of it is given in the plate annexed to this paper. It consists of a tailed bandage, two long lateral splints and splint-cloth, two calico bags containing bran, and broad straps with buckles, together with a foot-board, and, if necessary, lacs of calico for the purposes of extension.

The tails of bandage may be two inches and a half broad, and about two feet long. They should be applied neatly around the limb, with due regard to tightness, beginning from the foot. In a case of fracture of the thigh, the whole limb should be enveloped by them. The application of this bandage tends to steady and support the muscles, and if much inflammation be present, it may, when very lightly applied, be of use in conveying discutient washes. In a case of compound fracture, the bandage may be left out, to facilitate the discharge of matter, and to permit the application of poultices or dressings, without disturbing the other parts of the apparatus. The splints may be made of deal, of sufficient thickness to prevent their bending, and varying from two and a half, to three and a half inches in breadth, according to the thickness of the limb to which they are to be applied: they should be of equal breadth, as otherwise the limb will turn to the side of the narrow one. In case of a necessity for permanent extension, the external splint should be made as directed by Desault, with a hole and notch at either end, by which to fasten the lacs, and it will be advantageous, here, to have this splint of sufficient length to mount well up along the side of the abdomen, as the higher the point to which the lac is fastened, the more effectually will the extension be exerted in the axis of the limb. The superior extremity of the inner splint should approach as near the periosteum as circumstances will permit; in applying it to males, it may go somewhat higher than in females; its lower end should be made to project exactly to the same distance beyond the foot as that of the outer, as any inequality in this respect will be found to throw the limb to the side of the shorter one.

The splint-cloth should be about two yards long, and of sufficient breadth, when applied transversely under the leg, to reach from the heel to the top of the inner splint. The splints are to be rolled in this cloth, from the ends towards the centre, in such a manner as to leave sufficient space for them to be turned on their edges at the sides of the limb, and to hold be-

tween them and it, the pads of bran : it will be found advantageous to roll up the splints in the cloth, so as to bring them nearer each other at the lower than at the upper part of the limb, in accommodation to the difference of its thickness in these regions. The pads may consist of bags of linen or calico, half filled with bran, about one-third broader than the splints, and of sufficient length to extend from the sole of the foot to the top of the inner splint. The external may be somewhat longer than the internal. The leg being held up, the pads are to be arranged lengthwise on the splints, and the bran which they contain is to be apportioned in quantity, in different places, to the irregularities of the contour of the leg. The inner edge of each pad should be made to project towards its fellow, beyond the margin of the splint, by which means, when the leg comes to be laid on them, they will form a cushion underneath it, supported by the splint cloth ; the outer edge should be brought on a level with the corresponding margin of the splint. The limb, well-extended by two assistants, should be now laid down, and the splints and pads turned up along its sides. The act of turning up the splints should be accomplished quickly, as, otherwise, the bran will gravitate to the lower edge of the bags, and thereby fail in admitting of proper adjustment. The space between the edges of the splints, resting on the bed, and held together by the splint-cloth, should be exactly such as to allow the boards to lie parallel to each other, when turned up along the sides of the limb. The whole being thus properly arranged, they are all to be secured together by three or four broad straps and buckles.

When shortening of the limb requires the exertion of an elongating force for its removal, the application of extension, on the principle recommended by Desault, will best accomplish the object. But for the purpose of preventing excoriation of the groin, the upper lac or band for counter-extension should be filled, in a bag-like form, with bran, at the place where it is likely to exert most pressure. The ends of this lac, should be

long enough to be carried round the abdomen, after being fastened to the top of the splint, as, by so doing, the splint will be effectually secured to the side. In order that the extension at the lower end may be made as much as possible in the line of the axis of the limb, it will be found advantageous to draw the lac through a hole or slit in the centre of the foot-board, which will thereby serve as a pully to give the lac a perpendicular direction, before being turned towards the extremity of the outer splint, to which it is to be fastened. A piece of leather, introduced between the ankle and the lac, will save the skin from the injurious effects of pressure. The lac may consist of a long strip of calico, doubled up several times, into a breadth of about an inch and half, and smoothed so as to make it lie flatly. The mode of its application may be that usually practised for the reduction of dislocations, by which, extension is made equally from both sides of the member. A foot-piece, to support and steady the toes, is an essential part of the apparatus, as it not only affords great ease to the patient, but contributes to preserve the permanent immobility of the fragments. The application of it may be accomplished by a simple contrivance. A piece of board, the length of the foot, may be propped up against the sole by means of a couple of small bars of brass or other material passed, as represented in the plate, transversely through holes in the lateral splints. A number of such holes should be bored along the margins of the splints, previous to their application, into any of which the bars may be inserted, according to the elevation required for the foot-piece. Screws fixed in the ends of the bars will serve the double purpose of preventing the bars from slipping out, and of assisting in giving steadiness to the side splints. It is necessary to introduce a pad between the foot and board to obviate a disagreeable feeling of heat, of which the patient will be likely, otherwise, to make complaint. In fractures of the tibia, where extension is not called for, the lateral splints need not be of such length; but, in all cases, they

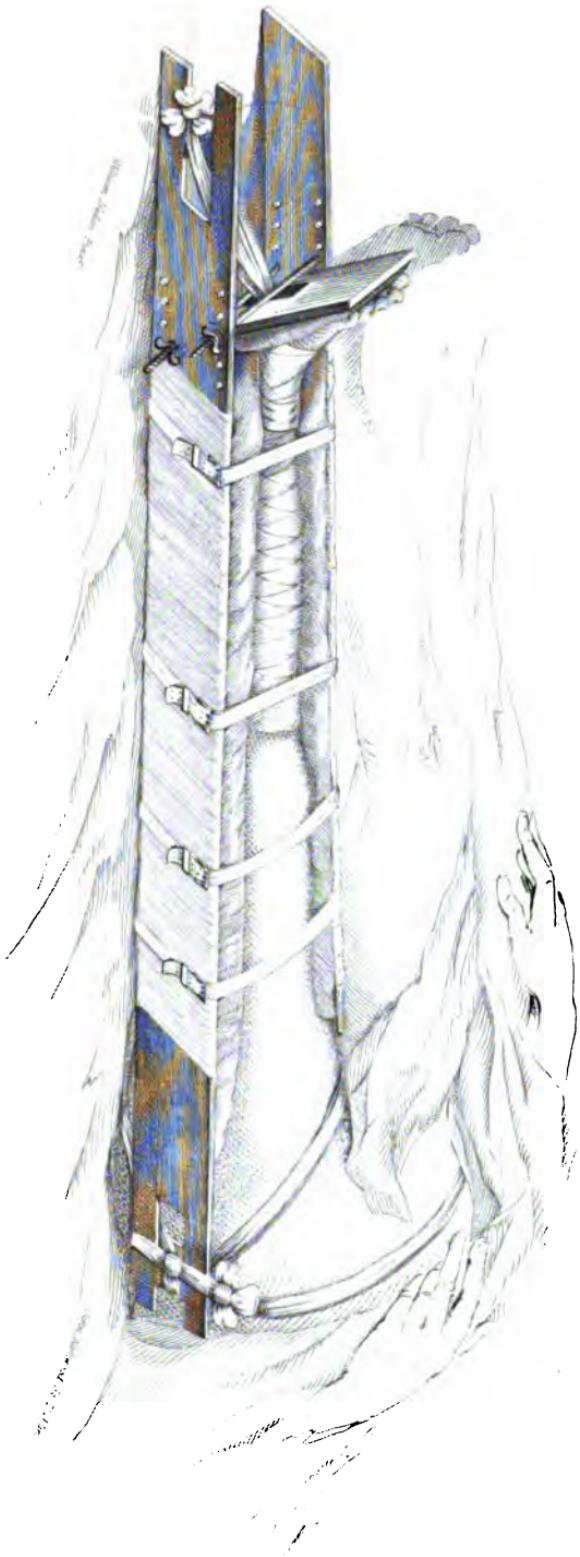
should extend above the knee, and sufficiently far below the foot to admit of the application of the foot-piece.

Such an apparatus, as this, can be procured at a moment's notice; it looks neatly when applied; is borne without inconvenience by the patient; and fulfils all the objects to be aimed at in the treatment of fractures of the lower extremities.

The annexed plate gives a representation of a limb dressed, in a case of fracture of the tibia, in accordance with the description above given. The drawing is so perfect and intelligible as to render any farther explanation of it unnecessary.

It may be said by the advocates of the flexed position, that I have not given this plan a fair trial, that I have adopted and advocated the treatment by the straight posture, rather than fulfilled the object which I set out to accomplish—that of drawing a parallel between them. But I contend that such objection is not founded in fact. I have not, certainly, selected a given number of cases, treated throughout by one method, and placed them side by side, with a corresponding number treated in the opposite way. But I have given cases, in which the plan by extension gave instant relief from suffering and deformity, after the flexed position had failed in accomplishing the same desirable object: I have adduced others wherein the plan by extension, from the first, produced beneficial effects, which could not have been obtained by any mode operating on the principle of relaxation: I have, finally, endeavoured, without any bias, other than that in favour of truth, to determine, from physiological considerations, the respective influences of these two opposite postures on the occurrence of spasm in the muscles, and derangement in the fragments of the broken bone: and, the conclusions which I have arrived at, appear to me not only consistent with the facts which I have advanced, but, also, with good and rational practice.

DR. MONTGOMERY'S MEDICAL-APPARATUS.



For the Doctor, the Manufacturer, and the Public.

ART. XX.—*On Tympanitis occurring in Fever, and the different Modes of treating it.* By R. J. GRAVES, M.D.

THE mucous membrane of the alimentary canal secretes air in abundance during health. The immediate uses of this secretion have not been sufficiently studied, nor have I now sufficient space to dwell upon this subject; it may be remarked, however, that the presence of air in the bowels must be of great importance, both physically and chemically assisting digestion, which essentially consists in the gradual softening and final solution of the solid food, and the absorption of the dissolved portions. Physically the air must facilitate the motions of the alimentary bolus, keeping the bowel in a suitable state of distension, and being ready immediately to occupy the place of the solid or fluid contents as they are moved about, or absorbed; chemically, it is well known that certain gases, such as carbonic acid, a gas always very abundant in the intestine, possess a remarkable power of rendering various solids more readily soluble in water, particularly when these gases are subjected to the effects of pressure in close vessels along with the solvent fluid, a state of things which exists also in the intestines; another chemically powerful gas secreted by the mucous membrane of the bowels is sulphuretted hydrogen. In the upper portion of the canal common air is most abundant, in the lower the two other gases become predominant, a distribution not fortuitous, but no doubt designed and destined to fulfil important purposes. It appears indeed that those portions of the alimentary canal, which secrete fluid acids (the muriatic and acetic) in abundance, do not secrete acid gases, while the remaining portions secrete these gases in greater abundance, so that the one may be considered as supplemental to the other. I am not aware that physiologists have as yet considered this subject in the point of view here brought forward, although it evidently illustrates many things connected with practice.

Thus I have remarked frequently, and I would call attention strongly to the fact, that in persons labouring under dyspepsia, and in whom the derangement appears to be limited to the stomach, the supplementary digestion in the small intestines appears to be carried on with great activity. Such persons suffer much immediately after having taken food ; they experience an oppressive sense of weight about the stomach, with flatulence and distention ; in fact, they feel exceedingly uncomfortable until the food passes into the duodenum, when the digestive power is in full vigour and activity. As soon as this occurs, the sense of weight and distention rapidly disappears, and they are no longer troubled with flatulence. I have further noticed, that such persons do not lose flesh or strength, and an inspection of their alvine discharges has shewn that every particle of nutritious principle has been absorbed and found its way into the system. This I have frequently observed. Persons will apply for advice who have been for a long time labouring under symptoms of derangement of the stomach, yet they are by no means emaciated, and are quite capable of discharging the duties of situations which require great mental and bodily activity. This shews that if the process of digestion does not go on well in the stomach, it must somewhere else. If in such cases the stomach is weak and unable to perform its functions, the remaining part of the digestive tube is strong, and pours out the fluids necessary for completing the process with great energy. Again, we meet with many persons who never complain of acidity, pain, flatulence, or sense of distention and weight in the stomach, and yet they are frequently annoyed with unpleasant abdominal sensations ; they have costive or irregular bowels, diarrhoea, tormina, tympanitis, fetid, unhealthy evacuations, and scanty, high-coloured urine. They feel uncomfortable, not immediately after a meal, but in three or four hours, they lose flesh and strength, and have a pale, sallow, unhealthy look. Here the dyspepsia is intestinal ; the stomach works well and per-

forms its functions with vigour, but when the alimentary mass enters the small intestines, it produces a great deal of discomfort, because the supplementary digestion is deranged, and its performance attended with much labour and difficulty. In some cases, both these forms of dyspepsia are combined, and these are of course the worst; but they may exist quite distinct from each other, and a patient, with his stomach in a perfectly normal and healthy state, may labour under dyspepsia from derangement of the digestive functions of the small intestines, or, with the latter in a healthy state, he may have indigestion from simple gastric derangement. We have indeed reason to conclude, that when organic or functional disease so impairs the energies of the stomach that it assists but little in the performance of digestion, the intestinal digestion becomes more intense; it is only thus that we can account for the absence of emaciation in certain cases, such as that of Napoleon Buonaparte, where, nevertheless, the stomach was so extensively disorganized as totally to prevent its taking any part in the process of digestion.

The preceding remarks, though not directly connected with, are nevertheless illustrative of the subject under consideration, it being evident that the secretion of air natural to the mucous membrane of the intestines during health may readily be augmented in disease, so as to give rise to intestinal tympanitis. This happens in all cases when inflammation or congestion attacks this tissue, an occurrence particularly frequent in fever. When tympanitis takes place in the commencement of fever, it invariably proceeds from inflammation, and is usually preceded by tenderness and other equally unequivocal symptoms of inflammatory action within the abdominal cavity. The remedy for this complication consists in local blood-letting freely applied, together with small doses of Dover's powder, with considerable doses of pulvis hydrargyri cum creta; all active aperients should be avoided, but emollient lavements are often useful. When tympanitis occurs during the middle or later

stages of protracted fever, it sometimes is inflammatory, but more frequently depends on a state of venous congestion, occupying a considerable extent of the mucous membrane of the small intestines, which consequently becomes gorged with blood, and livid, and secretes, among other morbid matters, a large quantity of gases. This tympanitis is often preceded by bowel complaint, unaccompanied by abdominal tenderness or pain in the first instance, a state of things which may last one or several days before inflation of the intestines commences. When this occurs, then, if it proceeds rapidly, the belly becomes painful and somewhat tender, on account of the sudden distention, and a superficial observer is thus apt to attribute the tympanitis to active inflammation. Now as this state of things takes place at a period of great debility, when the powers of life are already much exhausted, and when even the application of a few leeches may be followed by alarming weakness, it is evident that this tympanitis must be treated in a manner different from that above spoken of. In general it will be right to commence with the exhibition of ten or fifteen grains of magnesia, with the same quantity of rhubarb, given in some carminative water, such as aqua menthae viridis, or aqua foeniculi; when this has operated, the belly should be well stupefied and rubbed with a stimulating terebinthinate liniment. It often happens that after the operation of the rhubarb, the diarrhoea, and with it, the tympanitis begins sensibly to diminish, and then a little care will soon remove these symptoms altogether. Sometimes, however, no such improvement follows; and the belly continues to swell, while the bowel complaint is unchecked. This is a dangerous crisis, and requires the utmost judgment in its treatment. It is of great consequence to remark, that when bowel complaint has preceded intestinal tympanitis in fever, and when, notwithstanding the continuance of the bowel complaint, the tympanitis has gone on increasing, spirit of turpentine will seldom be of the least use, whether exhibited by the mouth, or in an enema. We must therefore, under these circumstances, look for some

remedy different from those usually recommended, and such a remedy we possess in the acetate of lead. Pathologists are agreed that venous congestion and active inflammation of the mucous membranes of the intestinal canal may often be associated together, and in fact, although these two states are different, and require different remedies, yet they so far approach each other as to require medicines taken from among the class of antiphlogistics; the one requires however a very different antiphlogistic from the other, just as chronic dysentery must be combated by remedies different from those suited to acute bowel complaint. Spirits of turpentine is admirably suited to the cure of congestive tympanitis in fever, where no bowel complaint, or a very slight one, has preceded or accompanied it. But is spirit of turpentine an antiphlogistic remedy? I answer, does it not cure certain cases of iritis, of sciatica, and of epilepsy? When, however, a bowel complaint forms a chief feature in the patient's state, and is associated with tympanitis, then the acetate of lead must be our sheet-anchor. I was first led to use this medicine in considerable doses in the latter stages of protracted fever on the recommendation of Dr. Bardsley, for the purpose of preventing that state of bowels which so insidiously leads to ulceration of Peyer's glands. Dr. Bardsley certainly deserves much credit for the introduction of this remedy, with which I became familiar in consequence of using it largely in Asiatic cholera, a disease in which the serous discharges are almost invariably preceded, and, when the patient recovers, invariably followed, *by a copious secretion of air into the bowels.* This it was which led me to observe the anti-tympanitic properties of the sugar of lead, for I found it to be *a remedy not merely for the secretion of serous fluid into the intestines, but for the secretion of air in that disease.* Afterwards analogy led me to apply it for the cure of tympanitis, combined with diarrhoea, in the middle or latter stages of fever, and I have had much reason to congratulate myself upon this new application of the remedy, for it has been very successful in my

hands. It may be well to observe that sugar of lead, besides its astringent, seems to possess *antiphlogistic* properties, otherwise we could scarcely account for its good effects in active hemorrhage and in violent action of the heart, for which latter it is much celebrated in France when given in large doses. In the above sketch of the treatment of tympanitis, my chief object being to point out the circumstances in which acetate of lead may be used, I have omitted noticing many other remedies and methods of treatment as sufficiently known by practitioners in general; among these probably none is more effectual than leeching the anus in inflammatory cases, and in *all*, mercurial dressing applied over a very large vesicated surface on the abdomen.

As I have mentioned spirits of turpentine as a cure for iritis, as first recommended by Mr. Carmichael, it may be well to observe, that it is extremely useful when, by judicious mercurialization of the patient, the destructive progress of the disease is arrested, but, as happens not unfrequently, again commences, notwithstanding that the patient's mouth is still sore, nay, though he may be salivated. Then it is, that spirits of turpentine often acts like a charm, and prevents the necessity of recurring to mercury a second time.

BIBLIOGRAPHIC NOTICES.

Das Eisen-Oxyd-Hydrat, ein Gegengift der Arsenigen Säure.
Von ROBERT W. BUNSEN, Doctor der Philosophie, und Privat-Docent an der Universität zu Göttingen, und ARNOLD A. BERTHOLD, Doctor der Medizin, der Kaisarl, Leopold, Carolin, Academie der Naturforscher, etc., Mitgliede.— Göttingen, 1834.

Hydrated Per-Oxide of Iron, an Antidote to Arsenious Acid.
By ROBERT W. BUNSEN, D. P., Private Lecturer in the University of Gottingen, and ARNOLD A. BERTHOLD, M. D., Associate of the Imperial Academy of Sciences.—Göttingen, 1834. Dieterich.

“ AUCUNE antidote reel de l'arsenic n'est encore connu, ainsi ni le lait, l'huile, le vinaigre, la theriaque recommandés par le vulgaire, ni le charbon en poudre vanté par Bertrand, ni les infusions adstringentes, conseillées par Chansarel, ni les sulfures alcalins n'ont la vertu spécifique qu'on cherche si gratuitement a leur accorder; en un mot ce phenix pharmaceutique est encore a trouver.”

This expression, of one of the most distinguished toxicologists of the present age, evinces how much importance is attached to the subject of the *brochure*, of which we purpose giving an account. According to MM. Bunsen and Berthold, this bird of the wilderness has been engaged, chemical research has given to them a means of constantly and completely neutralizing the deadly action of the arsenic existing in the intestinal tube, by an agent, which, is itself not merely destitute of injurious power, but possessed of energies positively beneficial to the human frame.

In the world generally, and we regret to say, even in the medical profession, there are very many persons who value scientific discovery, by the fraction expressing the ratio of profit to the capital expended; adherents of Smith in the position, that intellectual labour cannot be considered as real wealth, or

intellectual power, as beneficial to its possessor: men who would enumerate Newton, Dumas, and Laplace, as unproductive consumers; and reverence Davy, not because he demonstrated the nature of the alkalies and the relations of chemical and electrical attraction, but because he was the source of a reduction of perhaps three farthings a ton in the price of coals, by having somewhat diminished the chances of the machinery being injured by explosions. It is good to be able to meet such objectors on their own ground, to show them that from the abstract speculations or delicate experiments of the philosopher in his cabinet, have issued almost every comfort and enjoyment that as civilized and educated people we possess; that the mighty engine which is now changing the social position of every nation of the earth, had its origin in the abstract researches of Black; that commerce owes its really beneficial existence to the aggregated intellectual labours of that host of abstract inquirers into truth, who have given to us to understand the system of which we form a part.

Let it not be imagined that in thus speaking of the sentiments of such men we mean to undervalue the applications of science to the purposes of common life. To confer happiness upon his fellow-men is always the noblest aspiration of the sage, and he does it the more effectually by considering it to follow from the inquiring after truth. By abstract study he arms himself with improved implements of warfare, fits himself the better for successful contest against the darkening forms of ignorance and prejudice that flit around, and partially obscure the calmly-burning light of inextinguishable truth. The beneficial applications of a principle, when thus discovered, follow necessarily and as naturally as the stability of our proud architectural monuments result from their very tendency to fall.

Thus we find that until we apply to the action of poisonous substances the aids of scientific knowledge of their history,—until we have, by research, made out the combinations they are capable of entering into, and the change in their nature thus resulting, we cannot advance one step towards the discovery of a counter poison; and that not merely are popular or general ideas of their chemical relations necessary for that purpose, but that the most minute and accurate knowledge is required before we come to a decision. Thus a want of scientific knowledge left the unfortunate victim of poisoning by arsenic, to be destroyed by milk, by oil, or water. Imperfect knowledge made him put his trust in charcoal powder, lime, or an alkaline sulphuret. More accurate research has proved the injurious, or at least inefficient action of all these, and if it has not yet led to the discovery of a real antidote, at least gives to us a means of

strictly examining the results of those who may imagine they have succeeded.

The poisonous properties of a body are best removed by rendering it completely insoluble; and we must recollect that the peculiar fluids of the digestive canal possess a power of dissolving many bodies insoluble in pure water. An antidote must therefore convert the poison into a body insoluble in liquids of such nature as those generally met with in the stomach, and hence the inefficiency of a sulphuret in preventing bad effects from arsenic. Lead is thrown down by sulphuric acid, in a form completely indissoluble and inert; but if we apply an alkaline carbonate we obtain a matter insoluble in water, but dissolving so easily in the fluids of the stomach as actually to prove a most poisonous preparation. Another requisite for the good performance of an antidote is, that, as it must always be exhibited in excess, in order to leave as little chance as possible of any portion of the poison remaining unaffected, the antidote shall be of such nature as that the excess may not itself possess injurious action on the system. A third, if not indispensable, at least useful property, is, that the necessary quantity of antidote shall not occupy too great volume, but rather be of a nature easily administered.

In seeking on these principles for an antidote to arsenious acid, we are met by numerous and very serious difficulties; we have many combinations insoluble in water, but so easily acted on by acid or alkaline solutions, as to render it very doubtful whether in the intestinal tube they should be equally inert. In addition, the peculiar nature of arsenious acid, being very slowly dissolved by tepid fluids, and the insolubility of the material which may be used as the antidote, retard exceedingly their mutual action. The old maxim, *corpora non agunt nisi sint soluta* is not quite true in chemistry, but it yet prevails so far as to show the slowness with which a totally insoluble base can unite with an acid only sparingly soluble in the menstruum.

We shall now briefly enumerate the principle heads of MM. Bunsen and Berthold's work; we shall give a statement of the results they have announced, and the methods they pursued, and, finally, compare the principles upon which they acted with those that have been cursorily explained above.

Arsenious acid, or even an alkaline arsenite, does not precipitate solutions of the sulphate, nitrate, or muriate of iron, but if we add arsenious acid to a solution of acetate of iron, there is produced a clear brown precipitate, which is soluble in strong acids, but insoluble in water, acetic and arsenious acids.

MM. Bunsen and Berthold analyzed this precipitate, they found it to be composed of, in 100 parts,

Arsenious acid,	21,73
Peroxide of iron,	68,28
Water,	9,99

Evidently corresponding to a formula of one atom of arsenious acid united to eight atoms, or four double atoms, of peroxide. In the decomposition of acetate of iron by arsenite of potash, and the consequent formation of this precipitate, the acetic acid of eleven-twelfths of the acetic acid of the acetate decomposed becomes free. This appears to be the reason why it is not produced by a salt of iron with a stronger acid. The following passage, as containing the chemical grounds of the power of the antidote, we translate entire.

“ When a solution of arsenious acid is decomposed by freshly precipitated peroxide of iron, which is suspended in water, then filtered off the precipitate, acidulated, and tested by a stream of sulphuretted hydrogen gas, no trace of arsenious acid can be detected. To precipitate in this way one part of the arsenious acid, a quantity of the hydrated oxide will be required corresponding to ten or twelve parts dry. Yet with a much smaller quantity a very perfect separation is effected, inasmuch as a stream of sulphuretted hydrogen produces a mere trace of sulphuret of arsenic in the filtered and acidulated liquor. If the material be previously heated, or if the arsenious acid be added in small quantities at a time, there action takes place still more rapidly. When we add to the water in which the hydrated oxide of iron is suspended a few drops of caustic ammonia, it changes, by digestion, even solid, finely powdered, arsenious acid into basic arsenite of iron. The presence of ammonia, of chlorides, or other salts, does not prevent the precipitation of the arsenious acid. These properties teach us to recognize in freshly precipitated hydrated peroxide of iron, a body, answering to all the demands that the most particular chemical point of view can be made upon antidote to arsenic.

“ This body is endowed with two properties, which distinguish beyond all known antidotes: on the one hand it appears as p insoluble, and therefore without any action on the organism; the other its hydrated enveloping quality, from the commen fits it for overcoming the objection, which the difficult solub state of aggregation of the arsenious acid place to the exact chemical affinity. We have made many experiments by an : microscopic examination of the excrements of animals, to w poison had been given in the solid form, mixed with hydrated iron, and found that by the influence of the animal heat a staltic motion of the intestinal canal, it had been all changed senite of iron.

“ On the preparation of the hydrated peroxides of iron we add only a few words. The cheapest way to obtain it consists oxydizing, by nitric acid, a solution of pure proto-sulphate of ir

precipitating the hydrated peroxide by ammonia added in excess. The nitric acid should not be added until the sulphate of iron be completely dissolved, and the liquor should be boiled until it has become clear. The precipitate should be washed by decantation, and preserved in close vessels." — pp. 18-20.

The authors devote considerable space to discussing whether experiments on animals be a legitimate mode of determining the utility of an antidote; they then pass to consider what quantity of arsenic could, if left to itself, produce death in certain animals, and under this head are related several curious cases of the toleration of arsenic in very large quantities by man. They next prove by experiment, that an excess of the antidote can do no harm, and that the product of its action, the basic arsenite of iron, has no influence on the system. In the succeeding section, in which the mode of action of the arsenic on the animal economy is discussed, we did not find any matters of sufficient interest to justify their being translated. The injurious effects are considered, as being produced by the absorption of the poison and its being brought by the blood-current into contact with all the organs, but the pathological descriptions are of too loose a nature to make any important additions to our knowledge. We shall, however, deal more particularly with the fifth section, which treats of "*The rational Treatment of Poisoning by Arsenious Acid.*"

The ordinary though incorrect treatment of poisoning by arsenic consists in the administration of vegetable decoctions, as of linseed or mallow, the giving of milk, lime water, solution of soap, warm water, white of eggs, &c., together with the ex-hib: ^{hippo}, sulphate of zinc, or tartar emetic, when ^{es} not come on of itself, or by the ingestion of such occasionally there are given, so called antidotes, the phur or charcoal powder. Of these means the maseless and some injurious; our object should be to poison undissolved, whilst by the use of soap and n drinks, &c. we favour in every way its solution. ion of the poison from the stomach therefore re- the only method applicable in such cases, and very experience is quite sufficient to show how completely that is of fulfilling the end proposed. Having thus poorness of our former means, we shall allow our state the advantages of their proposal in their own

evil consequences of the mode of treating poisoning by lowered up to the present day, raise to a high degree of in-hydrated oxide of iron as a well-proved counter-poison to

arsenious acid, and it attains still more importance, as the direct action which that substance exerts upon the animal organization not merely is uninjurious, but may prove even most beneficial. Whilst it on the one hand removes every trace of the poison in solution in the stomach and intestines, and precipitates it as arsenite of iron, and absolutely prevents the solution of any further quantity of arsenic, it possesses equally the property of acting as a tonic and astringent, and of diminishing the absorbing power of the sanguiferous and chylous vessels.

“ By an application of this antidote, the vomiting, so much required in poisoning by arsenic, as well as the continual purging, produced for the evacuation of the poison, are rendered quite unnecessary. But yet it cannot be considered hurtful when these evacuations have come on either by themselves or by drinking innoxious fluids. There are even some cases where gentle vomiting should be wished for, as first, where the quantity of poison swallowed is so large as to require very considerable quantities of antidote: second, where there is reason to suppose the stomach to contain either vegetable colouring matter, as after the use of tea, brown or green, or sulphuretted hydrogen, as after the use of sulphur or eggs; for these bodies have a powerful affinity for oxide of iron, and diminish, by uniting with a quantity of the antidote, the certain operation on the poison; such an evil is avoided by giving the counter-poison in increased doses: third, where the stomach became very full of food, about the time of swallowing the poison, so that it cannot hold a sufficient quantity of antidote.

“ There are few cases in which vomiting does not occur before the arrival of the physician, but whether such has been the case or not, he should immediately proceed to the administration of the antidote. Should he not have the hydrated oxide of iron immediately by him, cold water is to be preferred to all other fluids, as it possesses less active powers of solution, and best serves to hold back the working of the poison until the antidote is prepared. The counter-poison should be given continually until it passes from the bowels in combination with the arsenious acid; but if vomiting comes on the doses must be small.

“ When such time has elapsed that the poison may have entered into the intestinal canal, the antidote should yet be given in smaller doses, and particularly if the arsenic has been given in substance, as many undissolved particles may remain behind. In such cases clysters of the antidote with water should be given, in order to neutralize the poison contained in the intestines and not yet absorbed. It can scarcely be necessary to add any laxative medicines to the clysters, but if it be, a little of the sulphate of soda or other neutral salt is preferable; castor oil should not be used.”—pp. 73-79.

“ Concerning the form of the antidote; it is to be given suspended in water. The quantity of it must be arranged according to that of the poison swallowed. From the composition of the ar-

senite of iron given before, it results that 3,11 parts of oxide of iron are necessary to precipitate one of arsenious acid; but he should commit a great error, who would conclude from this composition of the salt formed, to the quantity of antidote. The almost complete insolubility of the oxide of iron, the often considerable quantity of materials in the stomach, with which it mixes, and the moderate degree of solubility which arsenic possesses, render it necessary to apply a considerable quantity more than theory indicates. Experiment, which alone can instruct upon this subject, teaches, that from ten to twenty parts of oxide of iron as hydrate are more than sufficient to change one of arsenious acid into the basic salt. Now, suppose the quantity of poison taken to be four drachms, a case which could not be subdued by the most uninterrupted vomiting, there should only be required a few pounds of water, mixed with hydrated oxide of iron, to counteract its action. But since the amount of poison in the stomach and bowels can only be subjected to a very rough approximative valuation, so it is the best way to let the patient swallow the hydrated oxide of iron in as large quantities as he is able. It should likewise be applied as warm as possible, as thereby not only is the action quicker, but a smaller quantity suffices. If the arsenious acid has arrived in the stomach in an undissolved condition, there should be added to the antidote some drops of caustic ammonia, so as to give a slightly alkaline reaction. This addition seems to increase the solubility of the arsenious acid, and thus to facilitate the action of the oxide of iron upon it."—pp. 90-92.

In the above extracts we have preferred giving, in a somewhat condensed form, the spirit of the authors, than a quite literal translation. Even so, we have far transgressed our limits originally marked, and must very briefly discuss the remaining considerations. The work is concluded by remarks on the symptoms remaining after recovery from poisoning by arsenic, and those occurring when the dose has been too small to produce a violent acute attack, particularly exemplified in the diseased condition of workers in arsenic and kobalt mines. For them and the treatment recommended we must refer to the work itself, which, as a monograph on poisoning by arsenic, should have a place in the library of every toxicologist.

It must be owned that the object of MM. Bunsen and Berthold is one of paramount importance, and they certainly bring to aid in its accomplishment, an acquaintance with medicine and chemistry possessed by few. So far as their own evidence goes, the success has been complete, the chemical reasoning is without a flaw, and the numerous experiments which they instituted upon animals have given results highly confirmatory of their views. But the very importance of the subject should make us require an unusual weight of testimony

before according to it our belief; we must have not only the evidence of the proposers, which cannot be but tingued by their hopes, and subjective to their wishes, but the experiments must be again and again repeated by other persons, and under other circumstances. We know, how, even amongst the most upright, impartial, and honourable men, prejudices will creep in, and they will become biassed in favour of evidence upon one side; above all, in our own profession, we know the burst of acclamation with which a new medicine is received; no matter what its properties or composition, when first discovered it is a panacea: administered for every disease, people recover, and the cure is attributed to it: after some time, failures are remarked, a counter-current sets, and the body, become unfashionable, is thrown by, until another and unprejudiced generation ascertains for what it is really of use. This was the fate of opium, quicksilver, tartar emetic, bark, and kreosote, and exact observation has determined, that for many evils even gold yields no relief.

In these remarks we do not mean to throw the slightest doubt upon the results stated by the German authors, their talents, patience, and zeal deserve, and must receive, the warmest approbation. We merely state, that to establish completely their results, it is necessary that others should repeat such trials, and particularly as in Paris we have reason to believe some contradictory opinions now prevail. The subject is one well calculated to afford to the inquirer a rich harvest of popularity and fame, and we trust that by some of the eminent medical jurists of whom our city boasts, and whose chemical knowledge so well qualifies them for the task, the question, being decided here, shall add one more to the many triumphs, the medical school of Dublin has achieved.

ROBERT J. KANE.

On Dropsies, connected with suppressed Perspiration and coagulable Urine. By J. OSBORNE, M. D., President of the King and Queen's College of Physicians in Ireland, &c. &c. London, Sherwood, 1835, pp. 64.

The connexion between albuminous urine and an organic change of the kidney was first pointed out by Dr. Bright, and Dr. Osborne's work must be very gratifying to that distinguished pathologist and physician, inasmuch as it records opinions which agree with his, and to which the author, though

originally holding different views, was led by the observation of facts. To such of our readers as have not examined into these new doctrines, we may state, that it is held by Dr. Bright and his supporters, that a particular organic change of the cortical portion of the kidney produces an albuminous urine, and is followed by dropsy, and that for the cure of such a disease remedies must be directed to the kidney itself.

The first part of Dr. Osborne's work has already appeared in the form of a paper in this Journal, and as in the commencement of the second he states the result of his continued experience, we shall give it in his own words :

" On a former occasion I stated the facts which appeared to me to prove that albuminous urine, when continuously secreted, ought to be considered as a symptom of disease of the kidneys. Since that time I have continued to enjoy the same opportunities of observation as before ; and, though I have anxiously sought for evidence, either adverse or favourable to this opinion, I have not met with a single instance of urine coagulating in a constant manner, in which an opportunity of examination after death was afforded, that did not present the disease of the kidney ; nor, on the other hand, an instance of the disease being found in the kidney after death, in which, on taking a specimen of the urine in the bladder, it did not coagulate. On a review of the notes of all the fatal cases, I am also enabled to state, that the extent of the disease discovered after death has been, in every instance, in proportion to the degree of coagulation. Thus, when the urine only frothed on the application of heat, the kidneys, although gorged with blood, contained the grey, granulated structure exclusively in the outer portions of the cortical substance, and especially at the extremities of the gland ; while in cases of complete coagulation, the entire cortical substance was filled, or rather superseded by the deposition now mentioned, and the tubuli were both compressed and rendered indistinct. In some of the cases which have last occurred, I have also to mention that the emulgent veins were filled with a substance resembling the buffy coat of the blood, but of a curdy texture.

" I wished to pause before bringing forward this second part of my observations, in order to be enabled to ascertain the precise effect of several remedial agents. I was much surprised to find that this disease, which last year and in former years had been so frequent, had now become comparatively rare ; and consequently a greater degree took place than I had anticipated. During this summer and autumn, however, it has been nearly as prevalent as formerly. The fact appears to be, that chronic as well as acute diseases take place more in consequence of peculiar changes in the atmosphere, than from any agency acting on our organization. They, like acute diseases, epidemically, but move, as it were, in a larger cycle, and cannot

be observed in a limited space of time ; and hence their epidemic character has escaped notice. Those who have the charge of large hospitals will, however, be able to recall to their recollection, periods in which chronic rheumatism, dropsies, chronic bronchitis, or diarrhoea, prevailed, as well as those which were signalized by the simultaneous occurrence of acute diseases."—pp. 21-23.

In the majority of Dr. Osborne's cases, the disease seemed to originate from suppressed perspiration, and after describing the dry and morbid state of the skin, the author makes the following important observation :

" Whenever general perspiration came on, either spontaneously or in consequence of medicine, then the case always terminated favourably."

In the progress of the work accurate observations are given with respect to the complications occurring in the cases observed by the author, from which it results, (unfortunately for the doctrine of renal disease being indicated by albuminous urine,) that in most instances there was decided complication with visceral disease, and in particular with irritation of the mucous membranes. In the fatal cases, death occurred under a variety of circumstances. Among these were some instances of a low arachnitis, and in others of peritonitis, both of which the author believes to be produced by or connected with the renal disease.

It is not our intention to enter on the pathology of dropsy ; but we must remark, that numerous organic changes of other organs, and condition of the entire system are admitted to renal disease, as is the case in the majority; becomes a matter of the greatest difficulty to r' affection, and shew that the albuminous urine be considered as resulting from it alone; thi done, and in many cases, the yellow degener Bright, seems to be only a lesion of nutritior time has engaged many other glands. We utterance to the aphorism anathematized t' *further observations are required;*" but we what all must join us in, that further research will be received by the profession gladly, an which the importance of the subject, and t' author, must always command.

In the section devoted to treatment number of important practical observations management of the simple disease, but on its

and consequently more common form. For these we shall refer to the work itself, as we do not wish to be piratical as well as critical; but we must not omit the following passage: After describing his treatment of bronchitis, Dr. Osborne says,

“ Under the use of these and other similar applications, I have frequently had the satisfaction of believing not only that the bronchitis was at an end, but that portions of emphysematous lung were restored to a healthy state. If asked for the evidence of this latter fact, I answer, that regions of the thorax, which had an unnaturally clear sound on percussion, and yet no audible respiration, or which presented the dry crepitus, and clear sound of emphysema, were, when subjected to this treatment, found gradually to resume the respiratory murmur of health, while the peculiar dyspnoea, characterized by longer expirations than inspirations, was at the same time removed, or notably diminished.”*—pp. 53-54.

To Dr. Osborne then is due the merit of bringing the question of the curability of Laennec’s emphysema before the profession. On this point the discoverer of the stethoscope speaks doubtfully. After alluding to the combination of extravasated air with dilated cells, he observes, that it is of slight consequence as compared with the latter affection, as it may be removed by absorption; whilst we cannot well see how either nature or art can remedy the other morbid change. At the same time, he adds; that if the intensity of the cause which keeps up the habitual distention of the cells be diminished, we may hope that they will be actually lessened in volume.

From our own observations we fully agree with Dr. Osborne as to the fact, that Laennec’s emphysema is often a curable disease, or at least one capable of great alleviation, *for we possess evidence which is quite satisfactory of the diminution of the volume of the lung by treatment*, such as Dr. Osborne has described. We may consider the pathological condition of the air cells in the same point of view that we look upon chronic dilatations of other hollow organs, such as those of the stomach, colon, bladder, and heart. In these cases we commonly observe the two following circumstances to occur; first, that the cause of the dilatation is some mechanical obstruction to the exit of their natural contents; and next, that if this obstruction be

* “ It will be recollected how traumatic emphysema of the cellular texture under the skin is often absorbed with facility; and there is no reason why emphysema of the lung, caused by rupture of the air vesicles from violent coughing, may not, in like manner, be absorbed, when once the coughing has been stopped. And yet emphysema has been considered as incurable, and no treatment beyond palliatives is usually applied to it.”

long-continued, what was first a mere dilatation or distention of the organ becomes a combination of this with an organic alteration of the parieties, which is in most cases an increase of their thickness and strength. Hence the hypertrophy of the muscular fibres of the stomach when the pylorus, and of the bladder, when the urethra or prostate is diseased; of the colon in stricture of the rectum, and of the right cavities of the heart in affections of the lung. This change from mere dilatation to increase of growth seems to be a condition very unfavourable for cure, and the chances of its production may be stated to be directly as the length of time the obstruction is allowed to remain; for we know that in the early periods of these mechanical dilatations the removal of the obstruction is often followed by the return of the cavity to its natural dimensions. Applying these considerations to the case of dilatation of the air cells, it seems not impossible that in earlier periods the removal of the obstruction would be followed by a subsidence of the disease; for when we inquire into the causes of the affection we find these be principally, obstructions to the free exit of the contents of the cavities; the viscid mucus and the turgescence of the bronchial tubes being to the air cells what pulmonary obstruction is to the heart or urethral to the bladder, and the distention in these cases being perfectly analogous.

We cannot conclude this notice better than by the insertion of the following propositions, which contain the summary of Dr. Osborne's opinions on dropsy with coagulable urine:

“ 1st. That it is always connected with disease of the kidney, which, when sufficiently advanced, is marked by the deposition of a greyish structure, impermeable to injections, within the substance of that organ.

“ 2d. That the suppression of perspiration is the most general cause of this disease; and the long-continued excitement of the organ by spirituous liquors, or diuretics, the next in order of frequency and importance.

“ 3d. That the most successful treatment consists in the restoration of the functions of the skin; which being accomplished, the disease, if free from complications, never fails to be removed.

“ 4th. That bleeding and purgatives are also suitable remedies; while diuretics are either injurious, or, if removing the swellings for a time, tend ultimately to cause a return of the disease, under a more aggravated and intractable form.”

W. S.

A practical Treatise on Midwifery, containing the Result of sixteen thousand six hundred and fifty-four Births, occurring in the Dublin Lying-in Hospital, during a Period of seven Years, commencing November, 1826. By ROBERT COLLINS, M. D., late Master of the Institution.

AT length we congratulate the profession upon the appearance of a work worthy of that noble institution the Dublin Lying-in Hospital; we say at length, advisedly, for although no single school has more contributed to disseminate a knowledge of practical midwifery than that of Dublin, and although none has given rise to more numerous and important improvements in the management of the diseases and accidents to which parturient women and young children are liable, yet it has been justly complained, especially by foreigners, that the statistical information published has not been proportioned to the means so great an establishment affords. Doctor Collins states, that in seventy-seven years this charity has afforded relief to one hundred and thirty-one thousand women and upwards; had pains been taken during the whole of this period to collect statistical data, what a mass of useful tables would have been now accumulated. But let us not blame the excellent men who have occupied successively the station of Master to the Lying-in Hospital; they have, *without a single exception*, been most useful and diligent cultivators of the obstetrical art, and have all contributed largely to its advancement. It is only lately,—it is only within a few years that the necessity for enlarging what may be termed the statistics of practical medicine has been felt, and consequently the omission of many details cannot be attributed so much to the negligence or inattention of former Masters, as to the defective state of medical investigations during the times in which they lived. The advantages of the Dublin Lying-in Hospital have not been confined to the relief afforded to the patients, nor to the formation of such distinguished practitioners as its Masters have invariably been; it has conferred other and numerous benefits on the public, among which the most important is the practical education of students, who afterwards, scattered over the country, are the means of carrying into the remotest and most sequestered parts of the island the lights of science, in a department of medicine of all others the most important. By a wise enactment, both the Master and his two Assistants are obliged to reside in the hospital, so that no time is lost in affording aid on emergencies, and the task of making statistical inquiries on a large scale and with accuracy is facili-

tated, the inquirers being always on the spot and able to relieve each other, for the Assistants are always young men of known abilities and of considerable experience.

As the statistical part of Dr. Collins's work presents most novelty, we shall, in the first instance, direct the attention of our readers to some results to which the details lead. "Of the 16,654 children born in the hospital, during my residence, (says Dr. C.) 1121 were still-born; of these 614 were males." Our attention must be here directed to two points of inquiry, viz.—1st, the proportion of still-born children to the whole number born; 2dly, the relative proportion of male to female still-born children. With regard to the first, the proportion obtained from the data afforded by the Dublin Lying-in Hospital gives the number of still-born to other children as 1 to 27 very nearly, a proportion which exactly coincides with that of London, as given by Block. The proportion in Strasburgh is 1:11, Berlin 1:20, Vienna 1:24, Stockholm 1:36, and the means of these cities and several others is 1:22. So that Dublin exhibits in this respect a decided advantage; a fact which becomes still more interesting on finding that the proportion of still-born children in Prussia and Flanders, as reported by Caspar and Quetelet, varies according as the births take place in a rural or in an urban population, or, in other words, according as the mothers are more or less exposed to the influence of moral or physical causes detrimental to the health. Now there is no doubt these causes are more numerous and energetic in cities than in the country, and accordingly we need not be surprised at finding the proportions of still-born children in the former to those in the latter as 20:38. As both London and Dublin exhibit a mean between those two numbers, the general conclusion we arrive at is, that these cities present comparatively fewer moral or physical causes of ill-health, capable of affecting the life of the foetus in utero, than the Prussian or Flemish cities, although still inferior to the rural population of these countries, and much inferior to the inhabitants of Stockholm.

The second point of inquiry presents results still more striking and interesting, for as Quetelet observes, the male still-born children are much more numerous than the female: thus in Flanders, of 2,597 still-born, 1,517 were males, and 1,080 females, which gives a proportion of 14:10. It is very singular that Caspar, in investigating this subject, has found that exactly the same proportion obtained in Prussia. In Amsterdam the result obtained by examining twelve years, from 1821 to 1832 inclusive, gives 13 still-born males to 10 females. In Paris we have the proportion of 12.2:10. In Dublin Doctor Collins's

numbers gives the proportion very nearly the same as that of Paris, so that here we have an additional fact corroborative of those already brought forward to prove that *a greater mortality before birth prevails among males than among females*; a most curious result, well calculated to puzzle both physiologists and philosophers.

If we can attach credit to the returns cited by Doctor Hawkins, which from the year 1757 to 1825 gives the average of still-born to other children as 1:17, it is evident that a remarkable improvement has taken place, for during Doctor Collins's mastership it was only 1:27.

It is deserving of remark, that a very large proportion of the still-born children were *first* children; add to this the curious fact, that puerperal convulsions are much more frequent in women with their first children, (of 85 cases observed by Dr. Collins, Dr. Clarke, and Dr. Merriman, 73 were first children,) and it becomes apparent much greater dangers threaten both mother and child from the first than from subsequent conceptions.

With regard to puerperal convulsions, a review of the cases observed in the Dublin Lying-in Hospital has led to the following extremely singular and totally inexplicable result. We give Doctor Collins's words:

"There was but one case of convulsions during my residence in the hospital, where the child presented preternaturally; there was not one case with a preternatural presentation during Doctor Clarke's residence, and Doctor Labatt has stated the same fact, in his lectures while Master of the Hospital. In these three different periods there were 48,379 women delivered; so that from this we may infer, where the presentation is preternatural, there is little cause to dread the attack.

"This fact might be brought forward to support the opinion, that puerperal convulsions were caused by the irritation produced in the dilatation of the mouth of the womb. This, however, is not the case, as we not unfrequently find patients attacked when the os uteri is completely dilated, and all the soft parts relaxed. I conceive we are quite ignorant as yet of what the cause may be; nor could I ever find, on dissection, any appearance to enable me to even hazard an opinion on the subject."—pp. 200-201.

Here seems some connexion between preternatural presentations and an immunity from puerperal convulsions; and, nevertheless, it appears that convulsions occur much more frequently with first children, among whom, on the other hand, preternatural presentations are unusually frequent, for they amount to three-eighths of the whole number observed.

First conceptions then are much more productive of still-

born children, of preternatural presentations, and of puerperal convulsions, than are subsequent conceptions.

But Doctor Collins's tables still further swell this catalogue of evils attending first pregnancies, as at pages 172 and 196 we find that the proportions of haemorrhages subsequent to expulsion of the placenta, and the proportion of retentions of the placenta, are much greater in first than in subsequent pregnancies; while at page 305 we find that the only set-off against this list of dangers is a supposed comparative immunity from rupture of the vagina and uterus, an immunity, however, which Doctor Collins cannot confirm by his experience.

All this leads us to infer, *a priori*, that comparatively more mothers must perish in the first, than in any subsequent accouchement, and a reference to the table of deaths confirms this inference, for we find that of 164 deaths, 86 were of mothers giving birth to a first child. This proportion much exceeds that of the number of first-bearing to the whole number of women, for of the 16,414 delivered, 4,969 gave birth to *first* children, which consequently amount to more than a quarter, and less than a third of the whole number, or about three-tenths; whereas the number of deaths exceeded one-half. We beg the particular attention of our readers to this absolutely greater mortality of mothers in the first than in any subsequent accouchement, for it proves that the vulgar opinion on this subject is well-founded, although, no doubt, the real excess of deaths among mothers of first children is much exaggerated, and for this simple reason, that *few people are aware that of all the women annually brought to bed in any city, or country, so great a proportion as between one-fourth and one-third are always of first children!*

We regret that Doctor Collins affords us no data for judging whether the proportion of still-born children is greater in winter than in summer in Dublin, as in Flanders and in Prussia. It is probable the greater mildness of our winters would make the difference between the two seasons very trifling.

Doctor Caspar has shown that the number of the still-born is about doubled among illegitimate children as compared with legitimate; a very curious fact, but one which may be accounted for by the numerous causes of anxiety attending the period of pregnancy among the mothers of the former class. It is to be regretted that Doctor Collins could not, from the nature and regulations of the institution over which he presided, make the inquiries necessary to elicit information on this subject.

One of the most singular facts connected with still-born children, is the great number that are putrid when born. Thus of the 1121 above referred to, 527 were putrid, a proportion

much exceeding that which our notions concerning the operations of living organs would have led us to expect, and, indeed, nothing short of the absolute and direct testimony of Doctor Collins could induce us to rely upon its accuracy. How does it happen, that an organ so delicate in its sensibility as the pregnant womb, does not immediately feel the death of the foetus, and that with such a degree of intensity as to secure its speedy expulsion? The connexion between the living foetus and the womb, whether direct or indirect, is so extensive, so far as the circulation of both is concerned, that we cannot conceive how it happens that the death and consequent cessation of the foetal circulation can ever take place, without at once deranging the vital action of the womb so as to bring on speedy abortion; and yet, strange to say, about 300 of the putrid children were retained in the womb until the full period of gestation was accomplished!

"It is difficult," says Dr. Collins, "to assign a reason why so great a proportion of still-born children are expelled in a *putrid* state. Where the labour is very protracted, the cause is obvious; but in the great majority of such instances this is not found to be the case, as the general table here given clearly shews; nor is the child born *putrid* in the greater number of tedious labours."*—p. 460.

We turn with great pleasure to the chapter (p. 500) on the number of children dying in the hospital, as it exhibits in a most triumphant manner the superiority which the Dublin Lying Hospital can justly lay claim to, when compared with any similar establishment in Europe.

"The total number of children born was 16,654; of these 284 died previous to the mother leaving hospital; this is nearly in the proportion of *one in 58½*, which must be considered a moderate mortality under any circumstances; however, when it is considered, that this includes not only *all the deaths that occurred in children born prematurely, and in twins, but also every instance where the heart even acted, or where respiration ceased in a few seconds after birth*, the proportion of deaths becomes trifling indeed."—p. 500.

"I have thus given as many of the particulars respecting such children as died in the hospital as practicable without lengthening the detail to a wearisome extent. I have shown, that of the 284 deaths, 100 were *premature* births; thirty-two born at the full period, died in a *few minutes*; seventy, also at the full period, died in a short time after birth; more than the *half* within twenty-four hours; nine were

* "In the brute species, the birth of their young in a *putrid* condition is, I believe, very rarely met with."

destroyed by their mothers; nine were either diseased or imperfectly developed at birth; thirty-seven died of *nine-day fits*; fifteen were twin children born at the full period. Of the remaining cases, as also of such as exhibited any peculiarity, I have given the most important features.

"I have been thus minute, in order to satisfy those who will examine this subject with attention, of what I have no hesitation in stating as a fact, viz. that death in children, from the *effects of disease* during the first ten days, (with the exception of those attacked by trismus,) is not a common occurrence. The chief mortality is observed in children expelled *prematurely*, and in such as are born in *an extremely feeble* state, so as not to have strength to survive delivery many *hours*. This feeble condition is frequently the consequence of delivery, where the child presents preternaturally; or of the labour being tedious or violent; yet in the great majority of such cases, we shall find much difficulty in attempting to explain how this is the case. To prove, that tedious labour is not often the cause, it will be sufficient to mention, as is clearly shewn by the tables, that of the 284 children dead, the labour, in 246 instances, did not exceed *twelve hours*."—pp. 512-513.

We may observe that our friend, Doctor Jörg of Leipzig, has in a former number of this Journal pointed out a new cause of disease of death in infants, viz. an imperfect dilatation of the lungs during their first respiration.

The comparatively trifling mortality among the women delivered in the Lying-in Hospital, Dublin, is another subject of congratulation, as, on comparing it with former Reports of the same institution, it appears that the number of deaths had fallen to 1 in 100, from 1 in 89, the average number of deaths taking all the years from 1757 to 1825.

"Thus of the 16,414 women delivered, 164 died; or in the proportion of 1 in 100. If from this number we deduct the deaths from puerperal fever, which may be considered *accidental*, the proportion becomes greatly diminished, viz. to 1 in 156 deliveries; and again, if we subtract those deaths from causes *not the results* of childbirth, (which are marked thus * in the table,) the mortality from effects arising in consequence of *parturition* is vastly reduced, viz. to 1 in 244.

"Could the *great hazard* of entrusting a female in child-bed to the care of an individual ignorant of his profession, or as it is sometimes done to one of her *own sex*, be more clearly demonstrated, than in the catalogue of diseases which proved fatal to our patients? Here we see diseases as varied and obscure as under any circumstances whatsoever, requiring on the part of the practitioner, the utmost skill and experience. Out of the 164 deaths, there were no less than 97 cases arising from diseases perhaps amongst the most difficult of treatment; nor is it possible for a medical man to be placed in a situation demanding more decision and information, than in the management of

the 67 remaining cases, to which in the table the star is *not* prefixed.

"I know of no department in the profession, where the life of the patient is more immediately dependent on the measures adopted by the medical attendant, than that of midwifery; and I am happy in adding, that I believe there is none better provided with highly qualified and competent practitioners."—pp. 366-7.

In the latter observation we most heartily concur. The excellence of the Dublin Lying-in Hospital becomes more apparent on contrasting the mortality which takes place among the mothers delivered in foreign hospitals. Ought not enlightened Paris be ashamed of a mortality of one in thirty, and yet such it was in 1822 in the *Hospice de la Maternité* of that city? In Stockholm it is one in twenty-nine! In this respect Berlin exhibits a most decided advantage over the other capitals of continental Europe, for, according to Caspar, from 1819 to 1822, the mortality among the mothers did not exceed one in 152.

We hope that the present enlightened and learned Master of the hospital, Doctor Evory Kennedy, will pursue the statistical investigations commenced by Guiette, and which led to the conclusion, that about five children are born at night for four in the day. Every thing which illustrates the laws of periodicity in the human frame is deeply interesting to the physiologist and pathologist.

Nothing is more remarkable with regard to the Irish women than the frequency of twins.

"It is singular," says Dr. Collins, "that in Ireland, the proportional number of women giving birth to twins, is nearly a third greater than in any other country from which I have been able to obtain authentic records. Thus in France, the proportion is one in every 95 births; in Germany, one in 80; in England, one in 92; in Scotland, one in 95; but in Ireland, the proportion is one in every 62. Of 129,172 women delivered in the Lying-in Hospital of Dublin, 2062 gave birth to twins. Twenty-nine of the 129,172 produced three at each birth, which is in the proportion of one in 4450; one only gave birth to four."*—p. 309.

This and the rapid increase of the population in Ireland have much amazed many statistical calculators, and an Irishman, aware of the enormous annual increase of his fellow-countrymen, may well feel proud in giving his assent to the general result arrived at by Quetelet: "*La fécondité est faible chez les peuples pauvres et opprimés.*"

* "See *Philosophical Transactions* for 1787, where a case is recorded by Doctor Garibaldi, of five children at a birth. This is the greatest number I am acquainted with, recorded upon good authority, by any modern writer."

So far with regard to the most obvious statistical deductions derivable from the work before us. We shall now present our readers with a few observations on its practical contents, a subject we hope to see far more ably and fully handled hereafter by others more conversant with this important department of the medical profession.

In the section on tedious labour, Dr. Collins, with much earnestness, recommends the use of the stethoscope as a valuable means of enabling us to detect the life or death of the foetus in utero, and at pages 19 and 20, gives some remarkable cases of sloughing of the urethra, as illustrations of the lamentable results which might have been obviated by a knowledge of its use. Speaking of these cases he says:

"Had its application been known at the time of their occurrence, and delivery effected shortly after the child's death took place, without waiting till the natural efforts expelled it in a *pathetic* state, I have little doubt these women would have escaped the truly deplorable consequences that ensued. Such," he concludes, "must ever have continued to the incalculable injury of the patient and disgrace of the medical attendant exhibiting his imperfect knowledge, had not the means of detecting the death of the foetus with accuracy been found out."

The observations, p. 59, as to the *mortality* in footling and breech presentations, "being comparatively little, owing to any difficulty experienced in the actual delivery of the child, but rather referrible to causes operating previous to the setting in of labour," are well worthy of attention. The statement he sets forth of the numerous cases met with in the hospital, leaves, in our opinion, little room to doubt this fact, which, *being contrary to the general inculcated opinion*, is particularly deserving of notice.

In the treatment of the next species of preternatural presentation, viz. shoulder or arm, the author trusts solely to turning, or perforating the thorax and delivering with the crotchet; he does not see any advantage to be derived, but rather danger to be feared, for waiting for the occurrence of spontaneous evolution. "No instance of it," he says, "was witnessed in the hospital during his assistant or mastership, nor did one take place during the residence of Dr. Clarke, one excepted, of which the Doctor was not certain, as it merely depended on the report of a midwife, during which period *thirty-four thousand five hundred and seventy-six* women were delivered." The further remarks on the management of this form of presentation, with the delineation of those cases where perforation of the thorax becomes necessary, it would be injustice to curtail. The result with regard to both mother and child proves highly satisfactory.

The sections on the different forms of haemorrhage contain a fund of valuable instruction, evidently the result of close observation and much practical experience, and occupy eighty-nine pages of the work. Of these it would be impossible in a review to give an analysis in any way satisfactory, as the observations in the several sections are so intimately connected with each other, the whole must be perused to become acquainted with the contents. The remarks with regard to the forcible introduction of the hand into the uterus, as also against premature measures for the delivery of the patient when labouring under haemorrhage, should be carefully studied by every junior practitioner. "Such measures," Dr. Collins adds, "are only justifiable in the *most extreme cases of danger.*" His comments on the utility of opiates, in connexion with that restlessness which so frequently succeeds severe haemorrhages, are important, and the advantage derived from such treatment is markedly evidenced in the cases detailed.

In the succeeding section on Retention of the Placenta, the causes are accurately pointed out, with the treatment applicable in each. The statement as to the extreme danger consequent on the introduction of the hand under such circumstances, and also in haemorrhage, during the *prevalence* of puerperal fever, is well worthy the attention of the midwifery practitioner, and cannot fail to afford him a most salutary caution. He concludes, "I have no hesitation in stating, that almost all of the cases where such a measure was resorted to which terminated unfavourably at this particular period, would, under ordinary circumstances, have recovered without any serious consequences."

The article on Convulsions is one of peculiar interest, and as the exhibition of tartar emetic and opium, which forms a striking feature in the treatment adopted by Dr. Collins, has not been put forward by any previous author, and bears a striking analogy to the effects of these remedies in delirium tremens and in the delirium of fever, as recommended by ourselves, we would direct particular attention to the cases detailed, which seem to us most satisfactorily illustrative of the benefit derived from its adoption. Its utility in those cases where convulsions set in previous to labour, or in the early stage, before any attempt whatever can be made to deliver, or in such cases as he might be disposed to trust to the efforts of nature, is strongly dwelt upon, as the after-consequences of a delivery, effected when the os uteri is in an unrelaxed state, prove, in his opinion, singularly dangerous to the patient. Dr. Collins's successful use of opium in certain stages of convulsions must attract the notice of the profession, as many of our best

writers on midwifery are of a directly contrary opinion. We can safely recommend to our professional brethren the highly practical observations set forth in this interesting section.

In the next article, on Rupture of the Uterus or Vagina, Dr. Collins records two interesting cases of recovery from this generally fatal occurrence ; one of these patients subsequently gave birth to two living children, with the first of which premature delivery was induced. In nine of the thirty-four cases the peritoneal covering of the uterus did not give way, yet he states death ensued with equal rapidity. We entirely agree with the author as to the necessity of speedily counteracting the sudden and dangerous inflammation rapidly consequent on this injury. Its more frequent occurrence in women giving birth to male children is fairly adduced by the author as to disproportion between the child's head and mother's pelvis giving rise in most instances to this accident. The fatal cases are recorded with much accuracy, and will be found to afford much useful information as to the treatment, cause of death, and appearances on dissection.

In the section on Twin-births, the results in 240 cases are given with much minuteness, and will be found, on examination, highly satisfactory. The assistance of the stethoscope, as here noticed, may be interesting to such practitioners as have not yet applied it as a means of diagnosis in detecting the existence of twins.

We pass over with reluctance the three following sections, viz. on Triplets, Prolapsus of the Umbilical Cord, and Sloughing the Urethra, all of which appear deserving of attention, and proceed to notice that on the subject of Puerperal Fever, in which the author has given a minute history of the several periods at which this disease was epidemic in the hospital, and he states some interesting facts as to its occurrence during the prevalence of typhus fever, which strongly tend to show some connexion between these two diseases. It is singular that in Dublin the upper ranks of society, according to our author's statement, seem almost exempt from the low form of this disease, whereas in London, Edinburgh, and other cities, it is at times most fatal. Dr. Collins has accurately given, in eighty-eight cases, the period at which it attacked the patient, and also the date at which death occurred in fifty-six cases, in many of which is shown the rapidity with which it often proves fatal. Doctor Collins differs in opinion with those authors who state that patients who have suffered from tedious or fatiguing labours, or whose constitution has been much impaired previously, are the most frequent subjects of this attack ; this, we think, the statements brought forward seem fully to justify. On the subject

of prevention, Dr. Collins enters with much earnestness, and his statements seem to us highly deserving of attention.

"Of 10,785 patients delivered in the hospital," subsequent to the adoption of the plans he recommends, he adds, "only 58 died, which is nearly in the proportion of *one in every one hundred and eighty-six*, the lowest mortality perhaps on record in an *equal number of a similar class of females.*"

With regard to the extreme discordance of opinion as to the treatment of this disease, we think our author's explanation just, as the adoption of such opposite measures as are recommended, arises chiefly, in his opinion, from physicians treating of every variety of puerperal fever as one and the same disease, "whereas, perhaps, no other exhibits a greater diversity of character," a fact long ago pointed out by John Peter Frank, whose observations on the subject of puerperal fever are among the best we possess.

The cases detailed are numerous and satisfactory, and cannot fail to make the reader perfectly acquainted with the treatment adopted in the hospital.

With regard to the importance of visiting the patient immediately on the seizure, we quote his own words:

"I cannot here omit urging the great importance of the medical attendant seeing his patient *instantly* on her being attacked. In the hospital we made it an invariable rule at *all times* to visit every patient *twice* daily; but when puerperal fever prevailed, we visited every *six hours*; in truth it may be said, we nearly lived in the wards, and in my opinion, to discharge the duty effectually in such an establishment this must be done."

Such close attention on the part of the officers of this institution is highly creditable, and must have been productive of incalculable benefit to the patients; indeed the cases reported are self-evident proofs of this industry.

In thirty-seven of fifty-six cases which proved fatal, the morbid appearances are given. Effusion of fluid, though differing in character and quantity, was found to have taken place in all. In *twelve*, it seemed serum of a straw colour; in *eighteen*, seropurulent, and in *seven*, a bloody serum without any deposit whatever of lymph. All the cases but one in which the *latter* description of fluid was found, occurred in January and February, 1829, and rapidly proved fatal. This is an interesting fact, and if observed at *the same period* in Paris or London, in both of which places puerperal fever was at that time prevalent, might tend much to prove the dependence of this disease on atmospheric influences.

On the subject of Still-born Children, Dr. Collins has endeavoured with much care, as far as practicable, to give the cause of death in every instance.

He considers a venereal taint to be a frequent cause of the death of the child in *utero*, but in such its expulsion is in general premature. It is a remarkable fact noticed by Dr. Collins, that of the examples given of women who were delivered *two, three or four* times with the crotchet, but one died ; "thus satisfactorily proving, that where death succeeds this operation, the fatal result is not dependent on the *mode of delivery*, but upon the *circumstances* demanding such interference." We entirely agree with our author as to the necessity of physicians directing their attention rigidly to the *cause* of death in such children as are still-born.

In the latter part of the section on the deaths of infants some most instructive observations will be found in connexion with the occurrence of trismus nascentium in this hospital, and on the means used for its prevention, formerly suggested by the late Dr. Joseph Clarke, and productive of the happiest effects. The author concludes this subject by saying,

"Thus by his (Dr. Clarke's) valuable suggestions 16,371 lives have been saved ; as had the mortality of infants continued *one in six* till this day, the number of children dying of the 131,227 (which is the total number born in the hospital) would be 21,871, instead of 5500, as the hospital registry now shews."

This is an *astounding* fact, sufficient to arouse the attention of all those engaged in the management of large institutions, where numbers of young creatures are assembled together under the same roof, and calculated to enforce upon them the necessity of paying that attention to *ventilation* to which it is so pre-eminently entitled. We may further observe, had the mortality from the period at which the hospital was opened been in the proportion of *one in 58½*, as during the last *seven years*, the deaths would not have amounted to *one-half* even of the reduced number 5500 as above stated, and thus the number of lives saved would have been more than *doubled*.

We give the following interesting registry in the author's own words, which must have cost him much time to furnish :

"In order to ascertain, as far as possible, the mortality in the *earlier* periods of life, I kept a correct registry during my residence in the hospital, of the *total* number of children each patient had *previously* given birth to, and of the number *alive* at the time of her delivery.

"The result is, that at different periods the 16,414 women had

given birth to 53,458 children ; of these, 28,532 were males, or rather more than eight-fifteenths of the entire, and 24,926 females. (Of the 28,532 males 17,437 were living, or rather more than three-fifths, and of the 24,926 females, 16,468 were alive, or nearly two-thirds.

" Of the entire 53,458 children, 33,905, or more than three-fifths, continued to *live* at the time the mothers were *last* delivered."

Such is a very cursory, and of course unsatisfactory notice of the volume before us ; we cannot conclude without expressing the great satisfaction we have experienced in its perusal ; we can most confidently recommend it to the profession as eminently deserving their attention ; indeed we consider it a most valuable and necessary addition to the library of every midwifery practitioner. No work we are aware of exhibits more decided marks of unwearied industry, nor do we know any more likely to stand the test of experience, whether we consider the valuable practical remarks, the general success evinced in the reports of the cases, which are exceedingly numerous, and calculated to afford much useful information, the relative mortality, or the extensive tables appended to each section. Any one who takes the trouble of examining these tables, will be ready to acknowledge that vast labour, industry, and patience were required for their compilation. In this point of view we have no hesitation in asserting that Doctor Collins's book is unrivalled, and that it will be read with avidity in every country in Europe.

ROBERT J. GRAVES.

SCIENTIFIC INTELLIGENCE.

Clinical Researches serving to the History of the Diseases of Aged Persons, made at the Salpetriere, by M. Hourmann, Fellow of the Faculty of Medicine, Physician to the Central Bureau, and by Mr. Dechambre, Intern of the Hospital.

Diseases of the Organs of Respiration, Anatomical State of the respiratory Apparatus in old Women.—1st. *Thorax.*—The thorax in old women presents two very different states, that deserve to be pointed out. One of them ought to fix the attention, not as proper to that age, but, on the contrary, as constituting a remarkable exception, inasmuch as it is allied to a certain degree of vital energy, and offers a remains of the vigour of the adult age, permitting us to arrive gradually at the true senile alterations of the thorax.

“Qui habitu laxo, molliore et florido,” says Fischer, (de Senio p. 57,) “preediti sunt et mares et feminis in illis corporis forma externa non adeo graviter a pristina recedit, quin abundantia vasorum sanguiferorum cum abundantia floridi sanguinis in his senii annis pristinam egregiae conservat.” A great number of old men, such as Fischer describes, are to be met with at the Salpetriere. They are recognized by their fresh complexion, the free motion of their skin, and the fewness of wrinkles, which latter are by no means deep. The following is the state presented by the thorax of most women from sixty to eighty, and even beyond ninety years of age.

The mammae were still voluminous, for the most part pendent, but still preserving a certain consistence. There was lately in one of the wards a woman aged eighty, remarkable for her fresh complexion, whose mammae were sufficiently voluminous, and had the firmness of those of a woman of thirty-two years.

With these old women the thorax was entirely covered by a fatty membrane of variable and sometimes of enormous thickness; the muscles were full, and of a lively red colour; the costal cartilages had preserved a portion of their whiteness and elasticity; very often there was not one of them ossified. The elasticity and texture of the sternum and ribs were not different from those of the adult, nevertheless the conformation of the thorax undergoes certain changes. The most remarkable is a lateral flattening at its upper part, so that the antero-posterior diameter is augmented at the expense of the transverse: thus, the chest, viewed anteriorly, seems very narrow at the axillæ.

With such a disposition the thoracic cavity is mostly enlarged towards its inferior portion, and represents a pyramid with broad base and truncated summit; sometimes there is found a second narrowing about the edge of the eighth rib. But we shall return to this superior and inferior narrowing, in speaking of the second form of thorax.

The second form, which is the most frequent, is more or less characterized by the subjects in whom it is met with. The superior lateral flattening may be carried to an extreme point, as Scammoning has remarked: we have seen it in some cases forming a channel similar to that met with in rachitic subjects. In consequence of this disposition the posterior curvature of the ribs is very much augmented, and makes a round and even angular projection on each side of the dorsal spine; and as this aberration from nature occurs not always in an equal manner either with respect to the two sides or even throughout one side, there results in the latter case an uneven, rugged surface, which prevents immediate auscultation, and in the former case a difference in the projection of the two sides, which is oftentimes attributed to a deviation of the vertebral column.

The mobility of the sternum and the natural conformation of the ribs in front cause the anterior demi-arch of the latter to stretch out, carrying the sternum forward, so that the whole arrangement looks like two inclined planes meeting in front, having their angle of union truncated. All these deviations can be imputed only to old age. There are others that are caused by wearing stays, and which contract the base of the thorax, giving it in reality the appearance of a barrel: but in many cases it is not at its margin that the base of the thorax is narrowed, but three or four fingers' breadth above it. The margin itself, in place of turning towards the abdominal cavity, is turned outwards and widened, while the margins of the cartilages of the last ribs jut out under the soft parts.

This disposition affects the subjacent viscera, not in their relations alone, but in the conformations they are subjected to. Thus the liver, far from being pushed towards the chest, is removed very often from the hypochondriac region into the abdominal cavity, and the lower ribs closely applied to, and leaving impressions on its superior surface.

The right lung, too, occasionally undergoes a singular modification in form; instead of going up high at the right side it elongates itself, following the retreat of the liver, so that the difference of length and volume between the two lungs becomes less distinct, or altogether disappears. In this deviation from the natural form the sternum is always inclined forwards, but, its motions in that direction being restricted by the fixed state of the clavicle and first rib, the xiphoid cartilage is turned backwards, and covered anteriorly by the overlapping of the cartilages of the last true ribs as M. Cruveilhier has already remarked.

This forced change in the direction of the sternum, acting inversely on its two extremities, produces a sort of diastasis in the ar-

ticulation of the two superior parts, and a very prominent arch at its surface. Sœmmering has noted this occurrence when speaking of the relation of the anterior planes of the thorax and pelvis. These planes no longer correspond, the first passing beyond the second, while, according to him, the contrary is the case with old men. But the thoracic cavity experiences alterations not only in its horizontal diameter, but also in its longitudinal.

All anatomists have pointed out a diminution in the height of the intervertebral discs in the skeleton of old men. Sometimes these fibro-cartilages entirely disappear. Authors have related remarkable facts on this head. Thus Fischer gives an account of a man aged 100 years, nine of whose vertebrae were reduced to one bony mass. A similar alteration has been observed by Boërhaave throughout the whole length of the vertebral column. We have never observed this change to the extent observed by those authors; but nothing is more common than the union by bone of three or four vertebrae. Haller and others attribute this disappearance of the intervertebral cartilages to their absorption, while some think, with Morgagni, that they are replaced by ossifications. The first form, we are of opinion, is the most frequent, as the bodies of the vertebrae remain always distinct and rather diminished in height; besides all observers notice a shortening of the whole column.

According as age deprives the muscles of the strength requisite to support the trunk erect, the latter inclines forward; the plane surfaces of the bodies of the vertebrae become strongly applied against the anterior part of the discs that separate them. Thus it is, in this latter sense that union takes place from the first, according to Seiler, and renders the inflexion permanent. This inflexion is met with in various degrees, and mostly affects the last cervical and first dorsal vertebrae. With some old women it is so well marked and the scapula is so turned that the supra-spinous fossa looks forward. The cervical region is almost at right angles with the dorsal, and the chin is brought down on the breast; meanwhile another but an inverse curvature takes place in the lumbar region, the convexity of which drives far forward the base of the thorax, which gapes at the epigastrium, in the middle of which the xiphoid cartilage protrudes.

From this two-fold fact, viz., the shortening and inclination of the vertebral column, it results that the interval between the inferior edge of the thorax and the spine of the ilium diminishes, and that the ribs tend to approach one another principally forwards. Let us add to this another observation that we have often made, namely, that in consequence of the lateral flattening of the thorax the ribs are submitted to a torsion which, destroying the obliquity of their external surface, throws this face directly out, and disposes the margin, perpendicularly to one another, like the laths of a blind when abut. We can thus easily satisfy ourselves how the intercostal spaces should be narrowed; a fact easily proved.

Seiler (*loc. cit.*) has noticed, as a consequence of the inclination of the spine forwards, the lengthening and dragging of the extensor

muscles, and the shortening of the flexors; a shortening that becomes permanent, as is the case in those muscles of the extremities kept long in a state of flexion, and which is also to be observed in the sterno-cleido-mastoid muscles, which become tense as cords when the head is straightened ever so little.

Having thus spoken of the thorax collectively, as observed in those old women, let us consider their parts independently of their relations. With the single exception of the first form that we have mentioned, the general character they present is that of atrophy. The skin is of a dirty brown, coarse, dry, and thin. The prominence of the mammae has departed; the nipples alone point out the vestiges of them. The subcutaneous cellular tissue is deprived of fat. The muscles become extremely thin, so that they resemble their tendons of insertion.

In the midst of this general atrophy we are able, in some sort, to anatomize the thoracic region: thus it is easy to perceive the blood circulating in the large tortuous veins under the skin. They are seen to become full in expiration, and to empty themselves in inspiration. During the inspiratory motions the indigitations of the great pectoral muscles are to be observed, the muscle itself passing to the axilla like a small stripe. The line of union of the ribs and their cartilages is also seen, and the transverse crests of the anterior surface of the sternum.

The diaphragm also partakes of the changes in the thorax. The tilting out of the ribs to which it is attached, and the sinking of the liver, bring the insertions of the muscle together, and plait its surface. Each of these plaits may indent the surface of the liver as deeply as the edges of the ribs do. We merely notice the ossifications of its aponeurotic centre, which are rare, and which do not seem to exercise much influence on the act of respiration.

Union is always complete between the different parts of the sternum, except the xiphoid appendix, the embodying of which takes place at a late period, and not until the small pieces of which it is composed are perfectly united. The tissue of this bone is often very much reduced, presenting only large areolæ circumscribed by bony lamellæ, fragile, and filled with a sort of reddish pulp the colour of wine lees. The bone in these cases is easily cut by the scalpel.

The ribs are generally thin and light, and of a texture analogous to the sternum; on trying to bend them back they yield at first like the ribs of the adult, but suddenly snap across with a sharp noise!

Ossification of the costal cartilages is thought to be very common in old men, but in old women this occurs only in the first and second cartilages; they are certainly less supple than in youth, but it is very seldom that they are covered with a bony incrustation. Where this occurs it is known to take place from the centre to the surface, and proceeds generally from the external extremity to the internal. Several specks of ossification are to be met with in the same cartilage.

The bony union also of the chondro-sternal articulations occurs

more rarely than is thought. Most commonly this occurs by adhesion of the surfaces, in other instances it is the small capsular ligaments that ossify and form a sort of case which embraces the sternal extremity of the cartilages, as Gernet has remarked. (*De Siccitate Senili*, Lipsiae, 1753.) The costo-vertebral articulations preserve their mobility to the most advanced age.

SECTION 2. *Lungs*.—The anatomy of the thorax in old persons of both sexes affords numerous documents as to the physiology and pathology of the respiratory apparatus. M. Majendie has given many observations on the anatomy of the lungs of old persons, and has chiefly directed his attention to their intimate structure. We shall relate the result of our observations on the external conformation of the lungs of old women. We have noticed the changes likely to occur under this head from the alterations in the mechanism of the thorax. A nearly constant relation seems to exist in this case between the organs and the cavity which contains them. The aspect of the lungs may be referred to three typical forms, which are found to vary in the two lungs, or to be met with in the same lung no less distinct and characteristic.

First type.—The lungs referred to under this type are contained in a thorax as sufficiently developed as in the adult age. It is mostly in old women (the subject of this research) with firm and plump flesh that they are thus met with. These organs scarcely retire on an incision being made in the parietes of the chest. Their colour is grey ashy, they are studded with spots and lines of deep black, meeting at various angles, and describing lozenges more or less regular and frequent, chiefly towards the top of the lung, on a level with a radiated depression a sort of cicatrix in its circumference, of which we shall speak more at length. The heart, though well proportioned, as well as the great vessels at its base, are hidden by the expansion of the lungs that cover them. The cavity of the pleura is remarkable for its dryness; the finger is scarcely moistened by going over its surface. Lungs of this type are found closely applied to the diaphragm, are equal in length and in thickness both right and left, from the thorax narrowed at the eighth rib, having propelled the liver towards the abdomen. When removed from the thorax they give the sensation as of wadding when pressed: crepitation is not loud but plainly to be perceived. Their weight does not correspond with their bulk, which is capable of being inflated so far as to render them incapable of being replaced within the thorax. They preserve the conical form. In a word, they differ very little in exterior appearance from the lungs of an adult; but there is a peculiarity in the disposition of the great interlobular furrow in those who presented the lateral flattening of the thorax. This sulcus, which in the adult leaves the superior lobe of the right lung completely above, and then advances obliquely towards the root of the lung, to undergo that subdivision forming the inferior boundary of the middle lobe, and at the left side divides the lobes exactly into upper and lower; this sulcus,

we say, becomes so far vertical, that at the left side the lobes are so changed that one is placed directly in front, the other behind, while at the right side the middle lobe, being projected downwards, allows itself to be surmounted by the lower lobe, which rises so high as to form the posterior fourth and even more of the summit of the organ. It is in such a case that pneumonia of the top might occupy the lower lobe, as we shall see to occur by and by.

Second Type.—This second type approaches closely to the former in the regularity of its shape, but differs in regard to its volume. Those lungs are small and light, not yielding to inflation. A limpid and more or less abundant serosity constantly bathes them in the pleural cavities. The black spots and lines are more evident on their surfaces than in the first type; on compression the crepitation is peculiar, being less loud and more diffuse than in the lung of the adult; the heart is not developed, the thorax is remarkably narrowed, while the soft parts, that cover it are weak and meagre.

Third Type.—The lungs of the third species are entirely distinct in external appearance from the two former ones. They seem driven back against the vertebral column and crumpled up, the cavities of the pleure being more abundantly filled with liquid, except where old adhesions prevent the retreat of the lung, and these adhesions, sometimes laminated, sometimes filamentous, are situated near the summit. The inequality of their surfaces is not the only trait that characterizes these lungs: livid and flabby, they lose their conical form, and very often their top is more voluminous than their base. The division of the lobes is no less remarkable; they are sometimes united only by a thin pedicle, which leaves them as it were floating; the divisions, properly so called, have disappeared; inflation increases their volume but little; they are extremely light, and to the feel resemble the sensation given by pressing a roll of flax; crepitation is dull and slow; the heart is small, often in a complete state of anæmia, and the thorax presents that skeleton appearance we have already described.

Intimate Structure.—We have been able to follow in the details that we have just made the succession of changes by which the lungs are removed in old persons from the form and aspect of the lungs of the adult, and how the senile alterations of these organs proceed directly as those of the thorax. We find with respect to the intimate structure a relation no less constant between the containing and the contained parts, and which tends more and more to influence the transitions, by aid of which the difference of organization between the two ages is established.

Our observations are in accordance with those of M. Majendie, who lays it down as a fundamental fact that in the intimate structure of the lungs of old men there is an increase in the size of the cells from which results a considerable specific lightness. He has also observed that the changes in the pulmonary texture from the progress of age are more marked, according as old persons recede from the vigour of adults. But it has escaped the notice of this celebrated

physiologist to point out that state in which the senile peccant humours have attained their last degree, as may be seen by the only type that he adopts for its description, and particularly the cut he gives of it in the plate annexed to his memoir.

It is to be regretted that M. Majendie has not more completely examined into this affair. If he had done so, he would have, perhaps, modified the opinion which he professes relative to the pulmonary organization, an opinion which overturns all the most generally received ideas on the subject; while the cellular structure of the lungs of old persons, pursued in all its phases, seems to us to confirm these opinions more than ever. We shall now detail the result of the investigation of the three types of which we have spoken. In studying this we have followed the same plan as M. Majendie, with the exception of inflation; so the lungs could on being dried present us merely with their natural structure.

First Type.—Lungs voluminous; filling a well-developed Thorax, the soft Parts of which have preserved an embonpoint well marked.—The following appearances present themselves: on examining the thinnest possible slice of a lung of this type when dried, as it were, by the light, it is observed to be perforated by holes exactly round and united like the meshes of lace. The diameter of these holes is about a quarter of a line, their circumference is not interrupted in any part, so that they form cells perfectly regular, and every where independent lines, similar to those of the surface, divide the pulmonary tissue (or the slice so examined) into compartments of different sizes, and bound the lobules in the substance of the parenchyma. In the intervals of these lines are found others finer and more arborescent, and dividing *ad infinitum*. By aid of the magnifying glass they are recognized as vessels, and are traceable to the confines of the cells in which they are lost.

Second Type.—Lungs of a regular form, but small, bathed in Serum; confined Thorax; soft Parts, thin and lean.—A slice cut off these lungs, when dried, presents a cellular texture, different in many respects from the former. The round form of the cells is no longer met with in holding them to the light. They are so many ovals or slits of one line in their longest diameter, and angular at their extremities; their vessels have undergone the same elongation, and their divisions, when looked at with a lens, are less multiplied. The lines tracing the lobules are in other respects distinct enough, and the cells, although deformed, are still independent, and limited by a regular circumference.

Third Type.—Lungs of an irregular Form, withered, and bathed in Abundance of Serum, and applied against the vertebral Column in a contracted Thorax, with skeleton-like Emaciation.—In this type the cells have no distinct form. The parenchyma is converted into a spongy substance, the areolæ of which present no determined arrangement. A slice of the lung can be compared only to a torn mesh work, the broken parts of which intercept spaces as variable in extent as in figure. The lens discovers with diffi-

culty some vascular branches, but they are slender and few, and all lobular division is effaced.

Such is the cellular conformation which repeated observations have pointed out to us, after drying the lung which still allowed the air to permeate its interior, and in subjects who had never in their lives felt any notable impediment to their respiration; and they may be considered as presenting us an organic disposition which may be considered normal in the midst of other senile alterations.

In order to test the inductions from our researches, with all possible rigour we shall here compare the lungs of the adult with those of the old man, and measure their real differences with regard to the size of the cells. We are led to this comparative examination by the work of M. Majendie. We have dried without inflation lungs of adults of thirty to forty years of age, and found a difference of more than one-half in the diameter of their cells, compared with those of an old man's. Thus the cells of the lungs of an old man were one quarter of a line, while those of an adult were only an eighth or at most a sixth of a line. Pursuing this comparative examination then down the scale, we measured the cells of the lung in children of four and six years old, and those we found to be only one-twelfth of a line, or thereabouts. Finally, in a new-born infant that had breathed, the cells, appeared merely like the pricks made with the finest pointed needle.

This definitely established law had been rather foreseen than demonstrated by M. Majendie, since his researches have been incomplete. A law by which we find that the lung having the same volume loses in density, and offers to haematoisis a space which tends to diminish by reason of the progress of years, and which proves besides the increasing succession of senile alterations.

If rarefaction be but little marked in lungs of the first type, it becomes very evident in those of the second. Not only do the cells lose their form, but their elongation, and the tenuity of their parieties renders their breaking into one another more likely. The whole of the organ sinks. But it is in lungs of the third type that rarefaction attains its highest degree, and attains to true disorganization.

We see the intimate concurrence of all the altered parts of the thorax, in the respiration of old persons. The atrophy of the thorax accommodates itself to the atrophy of the lungs, and the exhausted vascularity is in direct ratio with that of texture.

We wish to call attention to one fact that tallies with the preceding observations, viz., the limpid serous infiltration into the cavity of the pleura which accompanies the more evident withering of the lungs in the two last types, and which contrasts so strongly with the dryness of the membrane covering the voluminous lungs of the first type. Do we not here observe an analogy between the infiltration and the accumulation of serum in the cranial cavity after atrophy of the brain, and might we not argue as M. Majendie respecting its use in the cavity of the cranium which it was destined to fill. In fact, there are limits to the sinking in of the thorax, and when this is at its utmost may it

not even then be insufficient to afford an application of its parietes to lungs reaching to the last term of senile extenuation. This proposition we put forward reservedly, but shall return to it more at large.

It is evident then that the description of the cellular structure of the lungs of an old man given by M. Majendie is incomplete, since he calls it a net-work of lacunæ like a *light froth*, and since this description applies only to the last degree of senile alteration of these organs.

Considering all the phases which the rarefaction of the tissues undergoes, is it not fitting to furnish general inductions on the pulmonary texture, and instead of recalling the ideas of Helvetius, (as M. Majendie's doctrine does,) in which one lobule of the lung is "*only a confused network, all of whose areolæ communicate together*," is not, on the contrary, the extreme regularity of the cells in the first degree of rarefaction more conformable to the theory of Willis who insisted on their vesicular texture, and above all to that of Reissessen, who has insisted on their being independent of each other? What remains for us to expose of our observations on the texture of the lung is in support of this last theory, and is in every respect formally opposed to that of M. Majendie.

Outstepping the ideas of Helvetius, M. Majendie does not admit of cellular tissue, properly so called, in the pulmonary lobules. They are vessels merely which, arrived at their extreme divisions, circumscribe by their anastomoses in every way the confined spaces where the air penetrates, and is separated from the blood only by the slender consistence of their parietes. Where the lobules begin there the bronchi end, and the mucous membrane also which lines them. It should be only the atrophied destruction of the pulmonary vessels which could bring on progressively the senile rarefaction of the parenchyma.

We now state what we have perceived even with the naked eye, relative to the last elements of the structure of the lobules. Here also rarefaction enlarges the field of observation, and will perhaps more and more aid the solution of so many undecided questions. In the centre of the group of cells, to whatever type the lungs, the dried slices of which we were examining, might belong, there were to be seen tracings of narrow elongated canals, one single partition of which, when cut into, exhibited the bottom pierced with holes disposed in the same line, and more or less multiplied. Sometimes the incision took in but a portion of the divided parietes, exhibiting the canal in the form of a quill, cut penwise, through which a fine stylet or hog's bristle could be introduced. The diameter of these canals varied from a quarter to half a line; very thin collateral branches occasionally went off from them, which, however, became involved in the net work of the lung. In the area of the roundest cells, but more evidently in the irregular cells of those in the last degree of rarefaction, it was easy to distinguish a thin and transparent pellicle, which became the more observable, the more the slice of lung was varied in its inclination to the eye. This translucent pellicle, exactly similar to that forming the parietes of the canals of which we have

just spoken; was observed adhering by its edge to the contour of the cells, floating and irregular at its free border; some cells, those chiefly that belonged to the slices taken from the surface of the lungs, were completely closed by the pellicle, and in whatever degrees the laminae might be inclined, it was impossible to perceive any orifice in the bottom of the *cavum de sac* that they appeared to close. Other cells, viewed in front, appeared also closed, but, examined obliquely, there might be perceived in the pellicle at their bottom a slit forming an opening in the circumference of these cells. It is on this pellicle, in cases of hyperemic congestion, that the disposition of capillaries the most minute can be discovered by a lens; it is manifestly this pellicle which gives them support.

What is the nature of these canals seen in the centre of the lobules? what are these thin pellicles which advance into the area of the cells? it is impossible, in our opinion, to misconceive in the first, the extreme divisions of the bronchi displayed in their trajet by a chance incision, and in the pellicles of the cells the incomplete parietes of these same divisions, where the incision has been made with a clearer cut and more perpendicularly. The holes piercing the bottom of these canals, which are arranged on the same line, and which can be considered only as subdivisions of the same canals cut at their origin, are in accordance with what Reisseisen says of the disposition like bunches of grapes of the lobular bronchi, reduced in size at the mucous membrane; in a word, shall we say that these cells, completely closed and at the surface of the lung, are only their terminating spheres or bubbles left intact by the incision. At all events the tissue of the lobules is not exclusively vascular, and senile atrophy influences more than one element of texture.

We shall here terminate this first part of our researches on the anatomical history of the lungs of old persons. It still remains to study the bronchial trunks and their larger divisions, and that of their mucous membrane, studies certainly very important, but for the purpose of bringing together the physiological and the pathological states, we shall refer the anatomy and physiology of these canals to the period of occupying ourselves specially with their lesions.

It is enough to state that the senile rarefaction extends to all the bronchial ramifications; noticing, above all, that the pulmonary mucous membrane in old persons is the habitual seat of an abundant secretion, a true physiological bronchorrhea.—*Archives Generales*, August, 1835.

Tracheotomy for syphilitic Ulceration of the Larynx, by Doctor Purdon of Belfast.—This communication is inserted as we received it in the form of a letter addressed to Mr. Carmichael.

Belfast, October 20, 1835.

MY DEAR SIR,

Should you consider the two following cases of tracheotomy for syphilitic ulceration of the larynx, worthy of inser-
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tion in the Dublin Medical Journal, they are at your service. They may serve as a species of appendix to your valuable paper on that operation already published there. In it you refer to cases, the notes of which have unfortunately been lost, many of them I perfectly recollect, as they occurred whilst I was a pupil in the Richmond Hospital, and it must be a source of regret that they have been lost. The principles of practice have, however, been sufficiently inculcated in your paper, so that the knowledge of the facts will direct those who are willing to avail themselves of your experience. Before entering into them perhaps it may be desirable to state the termination of Miss B.* She died in December, 1833, twenty months after the operation, during which time her respiration was free. Her death was owing to the prolonged suffering she endured from a constant discharge of pus making its way into the trachea from the thyroid cartilage, which became to all appearance carious; I say to all appearance, because I was never enabled to verify the opinions by a post mortem examination. Several times the integuments shewed indications of giving way, such as pointing, discolouration, or evident fluctuation, and as often did this subside, the expectoration was putrid and extremely offensive for many months before her death, her lungs all the time continuing sound. She steadily refused to permit me to puncture the integuments, consequently it was out of the question to remove a portion of the cartilage, as you recommended, judging from my reports that caries had ensued. If she had submitted to the operation in an earlier stage of the complaint it is probable the termination would not have been such as it was.

Mary M'Alister applied at the dispensary on 3rd April, 1831, complaining of dyspnoea, hoarse or croupy cough, dysphagia, pain on pressing the thyroid cartilage, breathing chiefly difficult in inspiration, voice whispering, considerable emaciation. States she has been affected in this manner for six weeks, progressively becoming worse. Had syphilis several months ago, for which she was salivated, and has had no other secondary symptom. Ordered a blister to the external fauces, and to take hydr. c. creta gr. v. calomel. gr. i. opii. gr. $\frac{1}{2}$ every six hours. On the 4th, breathing much worse, and evident threatening of suffocation rendering the operation imperative. This was easily performed, scarcely an ounce of blood being lost, as there was no vessel wounded. I was enabled to divide the trachea longitudinally at once with a scalpel, and then inserting a dissecting hook, to remove a portion from either side of the incision; she was then left with a tube in it, and the mercury directed to be continued every three hours. 6th, mouth sore, mercury omitted, and sarsaparilla substituted. She gradually recovered after this without the slightest unfavourable symptom, being only tormented for about three weeks by the expectoration of thickened mucus, similar to that which is expelled from the nose, and towards the termination of this time by an

inclination to cough, owing, I supposed, to catarrhization and contraction of the ulcer at the glottis, causing a sense of tightness there. She was seven months gone with child at the time of the operation, and in two months was safely and easily delivered. The child had afterwards some marks of syphilis, as a scaly eruption and a few cracks in the soles of the feet, from which it recovered after using some Hydarg. cum creta; and since this event she married and bore a second child about two years ago. I saw her last week, perfectly well, breathing, however, entirely through the tube. Her voice is completely gone, she is scarcely able to articulate the slightest word, and that apparently more by the expulsion of air taken into the mouth than by any through the glottis.

Margaret Coyle admitted into the lock ward of the Belfast Hospital in the latter end of September, 1835, suffering under the symptoms of laryngitis, e. g. whispering voice, cough, pain in swallowing on pressing the thyroid cartilage, wheezing respiration; says she has been affected with this formerly, and recovered when salivated. Ordered a blister to front of neck, and to take pil. hydarg. night and morning. This in about a week produced salivation, without any apparent alteration in the symptoms. I should mention that on examining the throat internally nothing unusual could be perceived. On October 1st, at the time of visiting, i. e. twelve noon, she was as usual, but late in the evening her breathing suddenly became tröupy. When seen on 2nd, expression of face very anxious, breathing extremely difficult, lips purple, pulse quick and weak. Not expecting that medicine would have any effect under these circumstances, I proposed the operation as a last resource, to which she readily submitted. This was not so easily performed as the former, owing to her neck being very short and the trachea working very much, so much that I was obliged to catch it with a hook before attempting to open it. Having caught it an oval piece was easily removed with a single sweep of the scalpel; no vessel except a small muscular one was divided, which ceased bleeding when pinched. Before reaching the trachea, and while separating the muscles, owing to the motion of the trachea, some air was drawn into the wound at each inspiration, and when expelled in expiration part entered the cellular membrane, causing an emphysematous appearance. This might not have occurred if broad retractors had been used, but the space between the thyroid cartilages and sternum was so short I was able to employ no other than two aneuristh needles. Immediately on opening the trachea her lips became florid, and there was none of that agony (if I may so call it) I have seen when the air suddenly obtains free ingress after the operation. She has hitherto (October 20th) steadily recovered without any bad symptom, wearing a tube as the former patient, her voice being also lost. The expectoration of thickened mucus is not quite so troublesome, and she is rapidly regaining flesh and strength. In neither was there any disposition to inflammation of the trachea.

I may mention that in both, immediately after the operation, the tube inserted was larger than the permanent one, it was an oval; the long diameter being rather more than the third of an inch, and the

shorter about the fourth; its length is about an inch and a half. The kind of tube both now in use, and which, after several trials, I have found the best, is a straight one, of a sufficient length to enter the trachea about the fourth of an inch; the length must of course vary with the thickness of the parts covering; it is circular and double, the inner, which requires to be cleaned occasionally, is the fourth of an inch in diameter, that being the smallest I have found they have been able to breathe through with any degree of freedom. The outer has no projection on the end entering the trachea, (as is generally made,) as it only renders its introduction more difficult, and scarcely, if at all, prevents its expulsion, in fact the patients, three of whom I have attended, prefer it without it. The curved tube, I have observed, is more easily expelled and more difficult to clean. The large one mentioned to have been used for the first few days is not so likely to become obstructed with the mucus, which is then most copious, as a small one, and gives much less uneasiness to the patient in cleaning. The tubes are retained in the wound by a tape passed through two holes in a small plate of silver on the outer end, and tied behind the neck.

Before closing this I may mention the case of a gentleman's child in the neighbourhood of this town who swallowed a beech nut, (if I may use the expression,) and after several weeks, either eleven or thirteen, coughed it up unchanged: during the entire time that it remained in the trachea he was subject to cough and expectoration, but as soon as the cause was removed he became perfectly well; no operation was of course performed, as there was only the child's own authority for it, and the parents scarcely believed it possible that such had occurred.

I trust you will excuse the prolixity of this communication; if it be unworthy of insertion destroy it, and believe me, my dear Sir,

Your ever grateful and obliged,

THOMAS HENRY PURDON.

To R. Carmichael, Esq.
&c. &c. &c.

On the Structure of Bone.—The following notice appears in the Report of the Proceedings of the Royal Academy of Sciences of Paris. “M. Gerdy presented a memoir, in which he proposes to prove: First, that the fibrous appearance of the cellular structure is owing to the grooves made by vessels. Secondly, that these grooves are longitudinal in the long bones, and radiating and diverging in certain flat ones. Thirdly, that the compact structure is composed of vascular canals, adhering to each other and taking the same direction as the grooves which open into them, as well as of reticular and cellular tissue. Fourthly, that the canalicular structure contains vessels lodged in a profusion of canals nearly parallel and longitudinal in the long bones. Fifthly, that the reticular structure is formed of filaments around which the vessels anastomose. Sixthly, that the cellular structure is varied in its nature, in accordance with

certain general laws indicated by the author. Commissioners, MM. Blainville, Serres, Roux, and Breschet." Now all this display of academic parade has, we have no doubt, a very imposing effect, and is well calculated to attract inexperienced persons; but it appears to us to be also calculated to give a false colour to the subject under consideration, to confer importance on trifles, and to encourage a system of patronage and favouritism, injurious to scientific investigation. We venture on these observations lest the system should be introduced here by some of those, who see no value in their own institutions because they cannot plume themselves upon their acquaintance with them, as they can upon the imperfect knowledge acquired in a hasty visit to other countries. As to the matter before us, it appears as if M. Gerdy was about to prove that which no one who has read the works of Malpigi, Haller, Albinus, Havers, Nesbit, Hunter, Reichel, Camper, Scarpa, Howship, and others, on this subject, will probably deny.

On the early Use of the Trephine in Fractures of the Cranium with Depression, by Dr. Boxwell, Surgeon to the Abbeyleix local Infirmary and Dispensary.—It has hitherto been found difficult to determine the precise time, when it may be necessary to have recourse to the operation of trephining in depressed fractures of the cranium. Many eminent writers being of opinion that a simple depressed fracture, with or without external wound, is not a sufficient warrant for using the trephine, unless urgent symptoms exist, and acting on that principle often delay the operation for days or weeks, and then operate with very little prospect of success.

The following case affords an example of the advantages to be derived from an early operation, before urgent symptoms appeared, and which, if postponed to a more advanced period, would not probably have had the same effect.

Richard Adams, set. 60, on the 29th of September, received a blow from a large stone on the right side of his head, which stunned him, and he lay for some time insensible; during that night he had frequent vomiting, pain in the head, and no sleep. He was brought to me next day, September 30th, complaining still of dull pain in the right side of his head, and irritability of the stomach: pulse 58. On examination I found a wound of the scalp, of a horse-shoe shape, over the right side of the frontal bone, and communicating with a depressed fracture of the same shape, but much more extensive; the lower portion was depressed more than half an inch, and very much overlapped by the other; the fracture appeared to extend into the parietal bone. He was perfectly sensible, had neither stupor, coma, or any symptom indicating that the brain was suffering; yet from witnessing many similar cases, in which the operation was delayed until symptoms either of inflammation or compression became evident, and then trephined without benefit, I decided on operating at once, and raising the depressed bone; with which view I enlarged the wound, making a triangular flap, which exposed a fracture extending in a horse-shoe

shaped through the entire extent of the frontal bone into the parietal; I applied the trephine on the upper part, and having removed nearly two-thirds of the circle, I attempted with the elevator to raise the depressed portion, but it was broken into so many pieces I was obliged to remove some of them entirely, and on raising the remainder I found a quantity of extravasated blood pressing on the dura mater, on removing which there was considerable bleeding from a branch of the middle artery of the dura mater, which I could not arrest until I used compression by applying pledges of lint dipped in cold water. The dura mater appeared healthy and uninjured, but very much depressed, and did not rise to the level of the bone on the pressure being taken off. I brought the lips of the wound as nearly as I could into position, applied cold dressing and the double-headed roller. He had some sleep that night, no return of vomiting, and less of pain, except from the wound.

Next morning, October 1st, pulse 60, intellectual faculties perfect, removed the external dressing; applied a poultice, and ordered half a drachm of pulv. jalape comp. every third hour, until the bowels were acted on.

October 2nd complained of throbbing pain in the wound; bowels well acted on; pulse 70. Removed the lint pledges, found the dura mater still depressed, but not so much, and coated with coagulable lymph; no return of hemorrhage.

From that day has had no unpleasant symptom; his pulse never over seventy; the discharge, at first profuse, gradually lessened, and after some days the dura mater threw up granulations; there was a small exfoliation from a part of the bone that had been denuded of periosteum, and in less than six weeks the wound was completely cicatrized, without its ever being necessary to use the lancet, or give him any other medicine than an occasional aperient. After the first ten days he was allowed generous diet, so that his general appearance and strength was just as good, if not better, than before the injury.

I could contrast this case with many others which I have witnessed, where the operation has been delayed, until stupor, coma, or total insensibility had set in, but where the antiphlogistic treatment had been rigorously pursued, and, as a last resource, the operation performed without any benefit.

Method of removing Particles of Iron from the Cornea.—The Revue Medicale for August contains a short extract from Hufeland's Journal, recommending the use of dilute muriatic acid as a wash for this purpose, by M. Krimer. Although we would not recommend the surgeon to trust to this means for the removal of the particles of iron so frequently driven into the cornea of workmen in our manufactories, forges, and workshops, much advantage may be derived from washing away the rust which sometimes remains in the wound with the proposed acid. Dr. Jacob, in a paper in the Dublin Hospital Reports, mentions the occurrence of permanent stain of the cornea from this accident, in consequence of the particle of iron being per-

mitted to remain in the wound until ulceration was produced, and the rust became entangled in the texture of the part. In such a case, after lifting the speck of iron from the wound with the point of a fine needle, if any discolouration remains, the part may be washed with a camel hair pencil dipped in a mixture of ten drops of the acid to an ounce of water.

Bread imperfectly baked to secure the requisite Weight of the Loaf.—The attention of the French Academy has been called to this method of cheating practised by the Parisian bakers, and most probably by many of the same fraternity in Dublin. This is, however, one of the least culpable of the various contrivances resorted to in the preparation of bread, which bakers are permitted to practise without the slightest interruption. We most seriously and earnestly intreat the members of the profession in Dublin to pay a little more attention to this matter. As regards invalids, at least, it is surely of some importance that their stomachs should not be offended with the sudden mass of musty or sour flour, doctored with alum and mashed potatoes, which is so frequently furnished by our bakers. The method of baking is execrable; the dough is rolled up into spherical masses which are arranged in the oven so as to touch each other, and subjected to a strong heat for a short time, by which a crust as hard as a stone is formed on the outside while the inside is almost raw. They are then taken out, torn asunder, and allowed to dry until the exposed surfaces become unfit for use, and require to be pared off, leaving a very small proportion of real bread fit for use. Even in the poor-houses in England the loaf is baked in a tin pan in a properly heated oven, and when furnished for use does not afford an ounce of waste in a loaf of four pounds, while the same weight in Dublin affords, perhaps, four ounces of hard crusts, coal ashes, parings, rappings, and other waste.

Supposed Case of Diffuse Cellular Inflammation, by Dr. Canvan of Armagh.—April 5th, 1835, I was consulted by a lady from this neighbourhood, on behalf of her little daughter, a stout made child of three years old, of a brown complexion, with sometimes a yellowish or bilious tinge, dark eyes and hair. The account her mother gave of her case at first was as follows:—On Friday evening, April 3rd, she had been standing on a chair, and had either fallen off, or “hurt her foot somehow,” in getting down off it. She complained of it to her mamma, but the appearances were so slight, that she contented herself with wrapping a little flannel round it, moistened with some simple emulsion. On Saturday morning, the child still complained much of her foot and ankle, and the mother repeated the emulsion, thinking but lightly of it, as it was scarcely at all swollen, and had no ordinary mark of inflammation about it, except the pain. Saturday night, however, the child was so restless, and complained so much, that her mother resolved to bring her into Armagh on Sunday, to have advice, which she did in her car, reuf-

sing her up most carefully. The appearances, when I first saw her, on Sunday, April 5th, at 11 o'clock, A. M. were as follows:—The child lay on her mother's lap, with her head reclining, and very dull; face sunken and sullen, paler than ordinary, tinge yellowish; eyes dull, heavy, and glassy; skin cool; respiration something quicker than natural; pulse small, quick, and thready, 100 or a little upwards; tongue loaded, whitish brown, and moist. Has, I am informed, no appetite, but a great thirst; bowels rather costive; sleeps scarcely any; complains very much of her foot and ankle. On examination, I found the foot and ankle a little, though not at all considerably, swollen, no redness, but a mottled livid cloudiness of the part, no increase of heat, but rather a diminished temperature. I ordered some leeches to the painful part, afterwards a stupe of chamomile decoction, and a calomel pill, with a little opium at bed-time, and a cathartic powder of the pulv. jalapæ comp. next morning. Next day I was sent for to visit the child, who, I was informed, was alarmingly ill. On reaching the house, at 3 o'clock, P. M., I found her delirious occasionally, comatose at other times, and again at times half-intelligent, attempting to show her tongue, but does not speak. The foot and lower part of leg mottled and cold, with vesicles rising on the dorsum of the foot, at the root of the toes. The leeches ordered yesterday had bled well, and the physic operated once. Her pulse now is intermitting, her face more sunken, her skin cool, and in fact dissolution appears rapidly approaching. I ordered a blister *immediately* between the shoulders, a mixture of the mist. camphoræ, spt. lavandulæ comp. spt. ammoniæ comp. and ætheris nitrici, a large spoonful every hour, or oftener, with sherry negus. I added some spirits to the chamomile stupe, and afterwards applied a hot poultice of bread and milk, ordering one of barm and oatmeal to be substituted when it can be procured. I also ordered a turpentine injection as soon as possible, and a powder of the pulv. Jacobi calomelane 3tiis. horas ad 3tiam diem. The child died at 10 o'clock, P. M. almost without a struggle, the coma carrying her off. I saw the body next day, and except that the limb was swollen up to the groin, and the colour or cloudiness not so evident, there was no change. The remarkable features of this case, in my opinion, are the age of the patient and the slight injury, if *any*, which produced so dreadful a disease. I have ever since considered it as a case of *spontaneous origin*, as the hurt, of which there was no other evidence than the child's own assertion, and to which she probably had been led by questions, was so slight that the mother could not believe she had got *any hurt*, even after close examination. In one of the late numbers of the Dublin Medical Journal, May, 1835, there is a case recorded by Dr. Benson, of a Mr. J. who died from the effects of a typhoid fever, having at the same time a slight wound on his hand received in dissection, which, however, *for several days*, gave so little uneasiness as not to be noticed. This case certainly *differs* from any of the cases which I have seen of what I call diffuse cellular or gangrenous inflammation. In any case which I have seen the *local sympathy*

toms were very obvious from the first ; the fever too which ensued did not assume the brown tongue, the suffused eye, the flushed face, or the quick, hard pulse of typhus, nor the hot and dry skin which accompanies that form of fever. I have recorded the case of a nursetender who died in the county hospital here, twelve years ago, and which came under my observation as one of the medical officers of that institution. The outline is as follows :— Maria Mara, a middle aged woman, dark complexion, spare, and of low stature, and very regular habits, a widow for several years, and having one child, and healthy, received, as was supposed, while washing the bandages of a man who had been admitted labouring under a phlegmous erysipelas of the leg, following a wound, and which man is alive and well at present to my knowledge, some portion of discharge or virus into a trifling wound which she had on the side of one her thumbs, near the nail ; this became painful ; a mottled livid inflammation or clouding crept rapidly up the arm ; there was little or no swelling or puffiness ; the temperature if not diminished not at all increased ; the glands of the axilla were very slightly tumified, and afterwards those above the clavicle ; the mottled appearances spread over the neck and top of the chest, over the great pectoral muscle of the side affected ; a low fever set in from the first, rapidly increasing, pulse small, quick, and feeble ; tongue loaded, whitish brown, and moist ; skin scarcely hotter than natural ; delirium set in at the conclusion, and she died on the third or fourth day. This case, as may be observed, accords exactly with that of little Miss M'C., which arose *without scratch or wound*, or indeed I believe *injury of any kind*.

On Trismus Nascentium, by John Breen, M. D., Hon. Fel. of the King and Queen's College of Physicians in Ireland, and formerly Assistant to the Dublin Lying-in Hospital.—I am induced to offer some remarks on this very fatal disease of infancy, from the following observations contained in a recent publication of Dr. Collins of this city. “With respect to the treatment of trismus nascentium, I have no suggestions to propose, as I have never seen an instance where the child seemed even temporarily relieved by the measures adopted. Calomel has been tried in large quantity, often in small doses, often repeated, as well as extensive frictions with mercurial ointment. I have tried frequent leeching along the spinal column, also repeated blistering over its entire length. Opium I have exhibited in many ways, both in large and small doses, also tartar emetic in the same manner, and at times both combined. I have tried tobacco extensively, in the form of stupes, and injections of various degrees of strength, from one grain to the ounce of fluid, to five or more, besides the frequent use of the warm bath, oil of turpentine, tincture of soot, assafetida, and many of the ordinary purgatives and stimulants, and all, as far as I could judge, without a shade of relief.”*

* See A Practical Treatise on Midwifery, by Robert Collins, M. D., London, 1835, page 516.

From the writer of the above observations having held the situation of Master of the Dublin Lying-in Hospital for seven years, few medical men have had more ample opportunities of acquiring experience in this disease. The result of my inquiries as to the pathology of the complaint strictly accords with the doctor's statement, that "from dissections in such cases we have never been able to discover any peculiar morbid appearance which would justify us in offering any explanation of the pathology of this disease." I am aware of Dr. Colles's suggestions on this subject, in the Dublin Medical and Physical Essays, but I believe that learned physiologist and intelligent writer rather designed these as hints to elicit inquiry and promote the elucidation of an obscure morbid affection, and that he did not consider his pathological views as established facts, or he would have made a reply to Dr. Labatt's observations in a succeeding number of the same Journal, denying the accuracy of Professor Colles's explanation of the morbid state, developed by dissection, and supporting the negation by post mortem investigations. On another point I also fully agree in opinion with Dr. Collins, "as to the importance of using every possible exertion for the prevention of a disease so universally fatal." The doctor's own opportunities arising from extensive hospital practice, are already referred to, and every medical man in Dublin who has examined his book, and is aware of his connexion with the late Dr. Joseph Clarke, whose position at the head of his profession placed him in the situation of meeting this affection in the very highest ranks of society, will in all probability join with me in the opinion, that though not directly, he gives by implication his relative's views of the intractable nature of trismus nascentium.

I will now proceed briefly to point out the means which have sometimes succeeded with me in conquering this formidable malady, which it is agreed on all sides, notwithstanding the most vigilant attention to prevent its invasion, will occasionally attack the new-born infant. My panacea consists in small doses of laudanum, joined with calomel, and castor oil to promote the purgative effect of the latter. An account of the mode of administering these remedies, which, if I do not grossly deceive myself, have been attended with as much success, in arresting an early progress to the grave, as can attach to the account of any cure of a formidable disease, must be interesting to those engaged in the treatment of early infancy, and lead them not to despair in similar circumstances. An event certainly desirable where high authority and morbid anatomy afford no encouragement. Again the plan of treatment proposes nothing violent, no repeated blistering of the spine, no mercurial frictions, no large doses of calomel, no tobacco in any form. In fact nothing but doses of laudanum calculated, in proportion to the early age of the patient, to allay irritation, and calomel chiefly with a view to its purgative action, and to obviate the costiveness caused by the former remedy. Where pathology affords no light to guide our conduct it is pleasing that our means of cure are calculated to relieve immediate suffering. Perhaps in the present state of our knowledge, though the term irri-

tation may be objected to, we do not verge too much into theory by considering trismus nascentium as a disease of irritation.

When the complaint develops itself I order one drop of laudanum in an ounce mixture, and of this I direct a tea-spoonful to be taken every second hour, until the patient appears to be affected with the narcotic properties of the opiate, which often happens after the third dose, then the mixture is given less frequently. A grain and a half of calomel is also administered every fifth or sixth hour up to the third time, afterwards it is not given more frequently than twice or three times in twenty-four hours, with intermediate doses of castor oil, in the quantity of a large-sized tea spoonful, sometimes joined with a third part spirits of turpentine, which appears to me to quicken the action of the former. I also occasionally order three ounces of the assafetida glisters of the Dublin Pharmacopœia to be thrown up the rectum. When this plan acts favourably it is followed by a longer interval between the convulsive contractions of the muscles of the frame. The upturning of the eyeballs, and almost disappearance of anything but the sclerotic coat, by the contraction of the pupils, also become less frequent. In the intervals of the paroxysms the opiate causes the child to lie more tranquil, and allows liquid food to be administered. When we have the assistance of a hired nurse, I direct her to milk her breasts, and exhibit this nourishment for the child's support. When the mother nurses, her anxiety is generally so great that we can rarely depend on her for help in this respect, and I then direct, as a substitute, two parts of barley water mixed with one of cows' milk, sweetened, and when asses' milk can be procured also have recourse to it. Should the disease be protracted, the susceptibility of the little patient to the influence of opium becomes lessened, and the quantity must be increased. I have never found it necessary to give more laudanum than in the proportion of three drops of tincture of opium in a two ounce mixture. I have occasionally, in protracted cases, laid aside at night the liquid form, and given a grain of the compound powder of chalk, with opium, of the Pharmacopœia, combined with a grain and a half of calomel. By this treatment I have had the pleasure of seeing the paroxysms decrease in frequency and violence, and finally disappear. From different circumstances, very frequently from the importunity of the attendants, before my opinion was decided as to the inutility of the remedy, I have witnessed the use of the warm bath in this attack, but always as it appeared to me without advantage. The approach of trismus nascentium is generally insidious, but I have now and again observed a single sharp cry proceed from the infant, while asleep, without its awaking, sometimes repeated two or three times at short intervals. I have in my mind compared this peculiar cry to the sharp bark which you may hear occasionally from a dog while sleeping at his ease before a fire. Whenever this symptom is observed I would recommend active purging, with calomel in grain and a half doses, followed by castor oil, and general vigilance as to the state of the individual.

By the plan of treatment now detailed I was fortunate enough to

save the lives of two children in the last year, 1834. The one, the only child of J—'s P—r, Esq., then of Mount Pleasant, Ranelagh, in the vicinity of this city; the other a son of W— R—e, Esq., barrister-at-law, Gardiner's-Place. Mrs. P—'s child, a male, her first, was a preternatural case, the breech presenting; there was some difficulty in establishing respiration after the delivery, and as the powers of life were languid a grain and a half of calomel was given immediately after birth. In this case, as well as in the other, the entire house was well ventilated, and the apartments, where each lady was confined, were large and airy. I am thus particular in the mention of locality and ventilation, as Doctor Collins, following up the suggestion of his father-in-law, believes that by attention to this object the occurrence of so fatal an attack may in a great measure be prevented. In proof of his assertion he adduces the diminution of the number of cases in the Lying-in Hospital, during his seven years' mastership. He states the occurrence of trismus nascentium to have been as frequent as fourteen cases in his first year, and reduced to three and four in his last years.* I believe I am not singular, among those who were concerned in the professional charge of the Lying-in Hospital, Dublin, after the period of Doctor Clarke's mastership, in considering the opinion that he had so materially diminished the occurrence and consequent mortality of trismus nascentium and puerperal fever, by his system of ventilation, as a hobby of that respectable man. His system was not particularly scientific, as it consisted of three perforations in the *upper* part of the window frame, each an inch in diameter, and smaller ones in the *upper* part of the doors of the different wards, together with an aperture in the ceiling, without any provision for the introduction of a supply of pure air. Yet that his own conviction on this point was very strong appears from his having, at an advanced period of life, gone to Edinburgh, to attend the meeting of the British Association for the Advancement of Science, in 1834, and having given notice of his intention to communicate a calculation of the saving of human life at its early period, arising from his improvements in the hospital. These improvements were first detailed in a paper read before the Royal Irish Academy, so far back as 1789. The great philanthropist Howard had visited Dublin shortly before that period, and the humanity, great sagacity, and good sense of this estimable man, first strongly roused public attention to the mischiefs following the want of a supply of pure air in our public edifices, when crowded with inmates. Howard's tact led him to surmise what, in a short time after the discoveries of Priestly, Cavendish, Lavoisier, and the other eminent chemists of that day demonstrated, the compound nature of atmospheric air, its alteration and vitiation by the process of respiration, and the consequent necessity for a fresh supply in our buildings, by a free communication with the atmosphere. Doctor Clarke's paper was read when all these subjects had the freshness of novelty, and at the time obtained for him much celebrity. Doctor Collins, with filial reverence, has

* See Doctor Collins's Book, p. 515.

given what I believe on not slight grounds, was the sum of the statement intended by his father-in-law for the British Association at Edinburgh, which is, that by "his valuable suggestions 16,371" lives in early infancy have been saved." Does Doctor Collins's assertion, that in his mastership, from 1826 to 1833, he reduced the occurrence of trismus nascentium from fourteen in the year to three and four, support this view? Does it not confirm the suspicion of the imperfection of Dr. Clarke's system of ventilation? Also does it not rather lead to the opinion, that there is a periodicity in the invasion of trismus nascentium, as we know there is in that of puerperal fever and several other diseases?

I need scarcely remark, that no educated medical man of the present day is ignorant of the advantages of well constructed hospitals, cleanliness in their management, and all those other points which, in some measure, come under the head of a well regulated system of medical police. Let not an investigation, whether too much benefit may not sometimes be attributed to these efforts, be considered as an attempt to depreciate their importance. The recent spread of cholera, and the total failure of all means of prevention, are strong instances in point. Another instance is, that in 1819 the puerperal fever made considerable ravages in the Dublin Lying-in Hospital, in the same year, as appears from Boer's statement,† at the great Lying-in Hospital at Vienna, which, in the number of patients delivered, and the general result of the practice, more nearly resembles the Dublin Lying-in Hospital than any other institution in existence, 2438 were delivered, and 150 died, chiefly from puerperal fever. Of the nature of this fever generally, that distinguished German says, p. 370, "hoc saltem circa boni maneat, illam (febrem) quando et quomodo cunque sponte appetat, sponte etiam cessare." Though at present believing the diminution of trismus nascentium, in the last years of Doctor Collins's management of the Dublin Lying-in Hospital, to be attributable rather to what I have ventured to denominate its periodicity, than to his improved system of ventilation, should succeeding years afford as few cases of trismus nascentium in that hospital as those referred to with honourable pride by him, I will hail his improvements in ventilation as valuable triumphs of science, over unmanageable morbid actions.

Having had a communication with Doctor Graves, the intelligent

* See Doctor Collins's Book, p. 514. There is an error in the elements of this calculation fatal to its value as a statistical fact. It being assumed in the calculation, that the length of time the patients remained in the hospital was equal, or nearly so, at all periods since its foundation, which is a mistake, as the institution was above twenty-years established before one thousand women were delivered in any single year. In these early years, the patients were frequently not dismissed for nearly double the time at which, when the building became more crowded, it was necessary to discharge them, as I ascertained, when assistant, from examination of the registry. The number of children dying then in the institution, according to the general law of mortality in early life, now demonstrated, was necessarily greater than in after years, when they remained little more than half the time in the hospital.

† Boeri Editio altera, Vienna 1830, p. 368.

Professor of the Institutes of Medicine in our Dublin School of Physic, since my attention was directed to the statements contained in Doctor Collins's book, Professor Graves has communicated to me, that in conjunction with Doctor Plant of Kingstown, with whom he was joined in attendance, he saved a child of _____ Esq., by the use of opium and calomel, from falling a victim to this fatal disease.

In this paper, put together with much haste, as must be evident from the recent appearance of the book which has elicited these observations, and the necessity of being prepared in time for the periodical publication in whose pages the Editors have so liberally allowed my views to appear, three cases of recovery, one under the care of Doctor Graves, and two in charge of the writer of this paper, are recorded in a very generally fatal disease: a disease so marked in its symptoms that it cannot be passed on the non-medical witnesses, either by the uncandid practitioner, or the over sanguine, for any thing but itself.

Mammary Glands in the Cetacea.—The last number of our Journal contains a communication from Dr. Jacob on this subject, in which he controverts the opinions promulgated by M. St. Hilaire, respecting these organs. We have just received a copy of a memoir on the same subject, by Dr. Knox of Edinburgh, which corroborates the facts and arguments adduced by Dr. Jacob and others, and may be considered to set the question at rest; a question which, perhaps, never should have been mooted had not the spirit of theory been stronger than that of observation.

Dr. Knox's paper is not restricted to this point, but contains much important and valuable information respecting the anatomical structure of the smaller species or variety of the *Balaena rostrata* or *Rorqual*, but we are compelled, from press of matter, to confine ourselves to an extract on the subject alluded to.

"On each side the fissure of the vulva, but perfectly distinct from it, being one inch and a half from its edge, and running parallel with it, are two fissures, three inches long, leading into cavities about an inch in depth. In the bottom of this cavity, and about the middle, there projects a small nipple-like process, about the size of the end of the little finger, the projection of this, however, being but little elevated. In the centre of these nipple-like processes, there is an aperture, sufficiently large to admit a middling-sized bougie; these apertures lead each to a canal, extending upwards under the integuments of the abdomen for several inches. Unfortunately their full extent upwards could not be determined, but they were traced for six inches, during which extent they had not diminished greatly in calibre, so that conjecturally, one-third at least of their total length had been removed in cutting out the parts. The membrane lining the interior of these tubes may be called mucous, just as all internal reduplications of the skin leading towards the interior of the body are so named; but in other respects it bore little resemblance to a mucous membrane, being neither villous nor covered with mucosities."

Long striae lay outside the membrane in the axis of the tube, like what we observe at the bifurcation of the trachea into the bronchial tubes. These striae may be, and in all probability are, longitudinal muscular fasciculi. Besides this, the tube presented a considerable number of orifices, which were found, on passing a silver probe into them, to be lateral tubes, communicating, of course, with the main one. The number altogether of these tubes and openings might be about a dozen. They were of different sizes, and three were observed close together, and a very short way within the entrance of the nipple. Into some of these lateral tubes a pretty large silver probe could be passed. In structure, these lateral tubes differed from the principal trunk; none of the longitudinal striae were observed in them, and their tunica became suddenly extremely fine, so that it was found impossible to follow them by dissection; but the mode of termination was easily enough traced by blowing air in, which shewed us distinctly that the principal large tube at first gradually, and latterly suddenly, branched out into a number of smaller ones. All this took place in a mass which was evidently glandular, and surrounding the main tube throughout its whole length, and into which glandular mass the lateral tubes penetrated in a direction always uppermost, and communicating with the large tube in such a way as always to look downwards, and in the course of the secreted fluids towards the nipple.

"On looking attentively at this glandular mass (of which the apparatus of tubes or canals we have just described constitutes evidently the excretory ducts) it bore, upon the whole, a considerable resemblance to the glandular masses in which the mammary ducts commence in the female breast; observing, at the same time, that there was nothing in the structure to prove their identity of function, and that, upon the whole, the glandular structure and its system of ducts in the Rorqual more resembled the pancreas than the human mammae.

The glands thus described lay outside the tendons of the abdominal muscles. There was no special investing capsule, but interposed between them and the integuments a layer of transverse muscular fibres, which fibres lay immediately outside the gland.

Wound of the Artery at the bend of the Arm in Bleeding.—A healthy woman, twenty-five years of age in the early period of pregnancy suffered this accident. A tourniquet was applied on the brachial artery, about the insertion of the coraco-brachialis, and a firm wet compress applied over the wound, the limb bandaged tightly up to the tourniquet, and placed in an elevated position rolled in flannel. The next day little complaint of pain was made, and the temperature of the limb was natural. The fourth day the compress was removed from the wound, and a tea-spoonful of healthy pus allowed to escape, affording great relief. Simple dressing, a soft compress of lint, and a slight bandage were applied, and the limb extended on a splint. The next day the tourniquet was slackened considerably without haemorrhage. The seventh day the tourniquet was removed

without haemorrhage. On the ninth day the report states that a "considerable quantity of fibrine was thrown out," and that the wound looked exceedingly healthy. We would recommend reporters of cases to state appearances, and not give them a name. Did this granulating sore at this stage secrete the proximate animal principle called by animal chemists fibrine? On the tenth day "the wound was nearly healed, there is much adhesive deposit still left round the artery, through which it may be felt pulsating slightly. On the twelfth day the arm was supported on a splint in a semi-flexed position, and a firm compress still applied over the puncture. After a fortnight more the wound was not quite healed, but in five weeks from the accident she was reported cured."

Mr. Tyrrel, who treated this case, says that this is the fifth case in which he has successfully adopted the above plan. In one instance where the person died from another cause some weeks after the accident, the median vein was found to have its canal obliterated for half an inch above and below the puncture, it was adherent to the artery, the wound of which was firmly united, and its calibre perfect. A case of wound of the radial artery at the wrist, treated in the same way with success, is recorded. Mr. Tyrrell observes, that he "considers this plan of treatment more especially applicable to cases of wounds of arteries, deeply seated, and difficult to get at by operation, without risk of injury to other important structures, such cases, for example, as the preceding one of puncture of the brachial artery in venesection or wounds of the palmar or plantar arteries. I have had opportunities of treating injuries of all the above-named vessels on the plan described, and all successfully. The principle of the treatment consists in arresting or diminishing the flow of blood to the injured vessel by pressure on the trunk or trunks communicating with it; in keeping the wounded parts carefully adapted by moderate pressure; in preventing venous congestion by position and support of bandage; and by forming the adhesive union by perfect quiet. It is necessary to persevere in the treatment for two or three weeks to insure a perfect cure."

This is a valuable communication, and we hope Irish surgeons will pay that attention to the subject which the facts and results deserve.—*Thomas's Hospital Reports*, by Mr. South.

Poisonous Sugar.—The American Journal of the Medical Sciences, for August, 1835, contains an extract from the Medical Magazine, detailing the consequences resulting from the use of sugar, accidentally contaminated by oxide of lead, probably from leaden reservoirs having been used for holding the fresh syrup. The account which is given on the authority of Dr. C. T. Jackson, states that one hundred persons are said to have suffered from its use in the town of Calais, Maine. The symptoms resembled *colica pictonum* of the severest character. Three have died after a protracted and most distressing illness; several others are still in a very critical state, and have suffered more or less from paralysis of the extremities. Five or six of those attacked set out for Boston, to seek medical advice, and

one of them, a young lady, died on board the packet under the most distressing symptoms attended with paralysis of the limbs; the rest bear the marks of great suffering, and are much emaciated. The sugar came from Barbadoes, and the captain of the vessel which brought it over has suffered from the disease. One sample of the sugar, submitted to analysis, afforded thirty-eight grains of oxide of lead in the pound of sugar. The reporter of this case very justly deprecates the use of lead for culinary purposes, and states that he has often traced the cause of *colica pictonum* to the use of water collected in leaden cisterns, or transmitted through leaden tubes, especially where water highly impregnated with carbonic acid, is raised through leaden suction pipes.

Vascularity of Serous Membranes.—Our attention is called to this subject from seeing a notice respecting it in the American Journal of Medical Sciences, extracted from the *Archives Generales* for December, 1834, which had escaped our notice. It states that Paniezza exhibits serous membranes *entirely isolated*, with a great number of vessels injected with coloured materials. Dr. Jacob of this city informs us that several years ago he injected portions of intestine very carefully and successfully, and so as to fill the vessels of the mucous membrane most minutely, but that on drying the peritoneal coat on mica, and immersing it in spirit of turpentine, no vessel could be detected unless the cellular membrane connecting the serous membrane with the muscular coat had been allowed to remain, in which case the peritoneum appeared very vascular, from its transparency permitting the vessels to be seen beneath. The absence of red vessels in serous membranes should not excite wonder, if it be recollected that a great proportion of the different structures of the body are provided with a transparent circulation only.

Surgical Society of Ireland.—The Surgical Society held its first meeting for this session at the Royal College of Surgeons, on Saturday, December 5th.

A large assemblage of members attended, and the vice-president of the College, Mr. White, took the chair, at 8 o'clock.

A report of the proceedings of the Society, during the last session, was read by the assistant secretary, Doctor Evanson, who had been deputed by the council of the society to prepare this Report; in which, after some preliminary notice of the objects, and constitution of the society, a brief detail was given of each of the papers read before the society during the last session.

We subjoin an enumeration of these communications, with the names of the authors, in the order in which they were read.

1. An Essay on the modes of investigating and determining the Actions and Uses of Medicinal Substances. By Doctor Evanson.
2. A Case of Poisoning by Sulphuric Acid, in which this substance was detected in a very minute quantity. By Doctor Beatty.
3. Notice of a particular Form of Menorrhagia. By Dr. Churchill.

4. Case of a Wound received in Dissection. Reported by Doctor Benson.
5. Cases illustrative of Diffuse Inflammation. By Mr. Cusack.
6. On the Application of Variations in Atmospheric Pressure to the Treatment of Disease. By Sir James Murray.
7. Cases of Medullary Fungus of the Eye, and Extirpation of the Eyeball. By Doctor Browne.
8. Case of Empyema. By Doctor Corbet.
9. Case of Laryngeal Disease occurring in a Child. By Doctor Falloon.
10. Case in which several Metallic Bodies were found in the Stomach. By Doctor Harrison.
11. On Hydrocele of the Chord. By Mr. Cusack.
12. Case of a Lunatic who was in the habit of swallowing Metallic Bodies. By Mr. Adams.
13. Venereal Affections of the Testicle. By Mr. Cusack.
14. The Anatomy of the Digestive Organs of the *Buccinum Undatum*. By Mr. Power.
15. Case of Laryngeal Disease, requiring the operation of Tracheotomy. By Dr. M'Adam.
16. Two Communications of Perforation of the Intestinal Canal, and its Consequences. By Doctor Alcock.
17. Case of Hydrophobia. By Mr. White.
18. Case of Poisoning by Hydro-cyanic Acid, successfully treated, &c., &c. Reported by Dr. Geoghegan.

It appeared from the Report read at this meeting, that the society is now entering upon its fourth session, and that during the three sessions since its foundation fifty-eight original communications have been read, of which twenty-eight have been published, and several others are in course of publication.

Letter from Dr. Christison of Edinburgh to M. Guibert of Paris on the different Sorts of Opium.

SIR,—A few months ago I took the liberty of sending you a sample of East India opium; I promised at the time to transmit to you a notice on the different varieties of the opium of commerce, in reply to your observations on that subject inserted in the *Journal de Pharmacie* for December, 1831. If you find the following remarks interesting I shall feel obliged by your laying them before the Society of Pharmacy.

My principal object in presenting them to you is to give you a just idea of East India opium. The chemists and compounders of medicine in Europe seem to be possessed with an erroneous notion respecting this sort of opium, in consequence, I presume, of its great scarcity in Europe, and of the alterations in the first samples sent to England as mere matters of curiosity.

For a long time East India opium was very impure, partly because it was badly prepared, but above all because it was adulterated with extracts of herbs, or other foreign substances. You may

have some idea of the amount of adulteration when I inform you, (on the authority of a quondam opium merchant at Calcutta) that the opium plants cost the opium merchants thirty per cent. more than the price of opium brought to market. Now-a-days, from the attention of the Company to the improvement of opium, that of the East Indies is a very superior article. You will see on this subject a very important and satisfactory memoir recently published in the Transactions of the Society of Medicine and Natural History of Calcutta, vol. vi., by Mr. Symtan, Inspector of Opium at Bombay.

The two principal species of opium of the East Indies are Bengal opium and the opium of Malwa. The first, from the account I have received from medical officers, and from the samples sent to me recently from Calcutta, are in balls, three pounds and a half weight overduoise, wrapped up in agglutinated leaves; internally the mass is of a deep colour, of the consistence of thick paste, having a strong and pure odour, and taste of opium. The Malwa opium is commonly in loaves, four or five inches square, or larger, and the samples that arrive here are more or less hard, are paler than the other, and of a clear brown, like the opium of Egypt. All the opiums of India that I have seen are exempt from the mixture of leaves, grains, and fragments of capsules, which are met with in the Smyrna opium. Mr. Smytan says that he has never obtained more than three and a half per cent. of morphine from Bengal opium, but the opium of Malwa has yielded five per cent. of the alkali, and from the best cultivated opium he has obtained $7\frac{1}{4}$ and $8\frac{1}{4}$ of morphine. Turkey opium has never yielded him more than $6\frac{1}{4}$ per cent., but he admits that the purest Turkey opium has not perhaps found its way to India.

From such opium as I sent you in the sample, I have obtained three ounces and a half of muriate of morphine, perfectly white, out of ninety-six ounces dried at 80° centigrade, being equal to $9\frac{1}{4}$ per cent. Now, Mr. Duncan of this city, a wholesale manufacturer of muriate of morphine, informs me, that he obtains 10 per cent. of muriate of morphine from Turkey opium. You perceive, therefore, that all the Indian opiums does not deserve the bad character given of them in your analysis, and you must have been deceived by the bad quality of the opium sent to you by our common friend M. Pereira. I saw his sample the last time I was in London, and it was very much inferior to those in my possession, and must have been sent to England at the time that opium from the East Indies was very much subject to adulteration. The only other sample that I met with in London was in the possession of Doctor Thomson, Professor of Materia Medica at the London University, and that was also very inferior in quality.

Though this opium has undergone improvement, it is still unknown in the English market; it is merely brought over as samples for druggists, and I believe I possess more of it in my museum than is to be found in all England. This is not owing to its great scarcity, but to this simple fact, that the export price from India to Calcutta is (considering the duty) higher than the price of Turkey

opium in the London market, at least such was the case a year or two ago.

In China, Indian opium is used in great quantities for smoking, and obtains a price three times higher than the Turkey opium. I have not sufficiently analyzed the Indian opium to allow me an opinion on this subject, but I expect large supplies from Calcutta, which will enable me to prosecute the inquiry. But the samples of those opiums that I have from India are evidently more resinous than the opium of Turkey, and while the muriate of morphine from the latter yields about one-twelfth of codeine, according to Dr. Gregory the muriate of morphine from the Indian opium contains about one-tenth of the alkaloid.

The Egyptian opium lately introduced into England, and of which you have taken notice, is similar to the Turkey opium, but not of a quality proportionate to its price. At least I have been led to think so, from the relative proportion of morphine it yields. Yet I have met with one very good sample, presenting the characters you assign to the opium of Egypt, and it, with the best opium of Constantinople, sells for two francs more per pound than the best Smyrna opium. From 36oz. I obtained 3½oz. of muriate of morphine, white and pure or 10½oz. per cent.

Opium of Constantinople is very rare in the English market which would lead us to suppose that this species is prepared for Constantinople consumption expressly, and occasionally finds its way to England.

I believe that the best Smyrna opium to be not at all inferior to the old Constantinople opium. I obtained from thirty-six ounces of Smyrna opium four and a quarter ounces of good muriate of morphine, which is nearly 12 per cent. I may add that I have never met with opium which gave so pale an infusion, or whose infusion produced with muriate of lime so many crystals of meconate of lime, and instead of containing one-thirtieth of codeine like common Smyrna opium, the above sample afforded merely some traces of that principle. This I take to be the greatest quantity of muriate of morphine that has yet been obtained from a similar quantity, particularly if we take into account that the opium was fresh, and contained at least one-sixth of water. If dried in a vapour bath it would not produce less than 14 per cent. The opium of the East Indies and of Egypt contains only one-fifteenth of water. Perhaps it is the beauty of the Smyrna opium, now common enough in London, that has superseded the variety called Constantinople opium.

In the analysis here referred to, the muriate of morphine was prepared by the decomposition of infusion of opium by muriate of lime, finishing by Dr. Gregory's process. The muriate was purified until it obtained the most perfect whiteness, for it is very important in a comparative analysis to estimate how much colour may disappear in the last purification. It was dried at 140° Fahrenheit, until it lost no more of its weight, which is important, for the muriate of morphine, dried by the manufacturers at very low temperature, retains much hygrometric water; when carefully dried there does not come

off more than 12.7 per cent. of water of crystallization at 212° Fahrenheit.

I am convinced this is the only true method of finding the relative value of the different opiums. The simple precipitation of the infusion by ammonia is a deceitful method, for the morphine is precipitated of different colours according to the proportion of resin in the opium, and thus the relative quantity of pure morphine should vary. Besides it is probable that the narcotine, which is also precipitated by this means, and reckoned with the morphine, does not follow the proportions. Dr. Ure's method of ascertaining the meconic acid is quite impracticable, for the morphine and meconic acid are not in proportion with one another.

CHRISTISON.

Treatment of Contraction from Cicatrix.—M. Lisfranc gives the following case:—A man had a very bad cicatrix in the palm of the hand, which nearly brought together the thenar and hypothenar; it was from a sabre wound. M. Lisfranc made in it three incisions parallel to the axis of the hand, but without touching the palmar sponeurosis. The lips of the incisions were kept asunder by an apparatus adapted to the back of the hand. A new cicatrix was thus formed, allowing the expansion and free motion of the hand. According to M. Lisfranc, this proves that there has been too general application given to the labours of M. Delpech.—*Rev. Med.* Aug. 1835.

Preparations of Silver against Syphilis.—M. le Professeur Serres, of Montpelier, has announced the successful results obtained by him in the treatment of old and serious syphilitic diseases by the use of chloruret of silver and ammonia, of oxide of silver and of argent divisé. He is now engaged in researches on the effects of cyanuret and ioduret of silver.—*Rev. Med.* Aug. 1835.

Extraordinary penetrating Wound of the Pelvis by a Stick eight Inches long, which was driven into the Sacrum.—On the 19th of June, A. Riviere fell from a cherry-tree on a sharp vine-stake. The instrument entered at the fold of the buttock, tearing the skin, muscles, and other tissues of the pelvic cavity, and broke off on a level with the integuments.

The stake, from the direction it took, must necessarily have engaged the rectum. But the first indication was to extract the foreign body, which was attempted by a physician in the neighbourhood without success. The stake was seized with a pincers, the handles of which were kept together by a blacksmith's slide, to this a cord was attached, which was pulled by six men, while others held the patient, and though they exerted themselves for four hours their efforts were completely useless.

On the 21st of June the patient was taken to the hospital, and immediately the five intern-pupils began to extract the stake, having first enlarged the external wound. A three-branched speculum ani

was introduced as far as possible; the stake was seized hold of by Lecat's brise pierre, which is furnished with a vice, and an hour was passed in useless attempts.

It was suspected that a knot of the piece of wood, or a portion of it partly detached, struck like a barb in the soft parts. The speculum, the finger, a gorget, were in succession made use of to try and find the cause of resistance.

At ten o'clock at night, M. Moulinié applied Lecat's brise pierre, but the instrument came off scraping the wood, as it had been attached in the direction of its fibres. He next seized the foreign body at right angles with its fibres. Cords were then placed to the inside of the brise pierre, and traction performed in the axis of the foreign body; but the cords broke. They next applied a rope, the thickness of the thumb, and pulled by four assistants, while others made counter-extension, the patient was pulled about, yet the foreign body never stirred. The operator fancied for a moment that the stake might be caught in the sciatic ligaments, and had an idea of cutting them, but was deterred by the danger of wounding the arteries in the sciatic depressions. Seeing the uselessness of pulling, M. Moulinié seized the branches of the brise pierre and rotated the stake on its axis, afterwards moving it in all lateral directions, as a carpenter hammers a nail to one side or the other to loosen it. These manœuvres, assisted by traction, so far loosened the foreign body that at the end of two hours it was extracted.

The finger was then introduced into the wound, to ascertain if any fragments remained, when it encountered a very rough bony anfractuosity: this was the body of the sacrum where the stake drove. The resistance to extraction was then explained; the stake being made of pine, a spongy wood, and much dried in the sun, when driven into the sacrum had imbibed moisture, swelled and become mortised in it. The bone itself must have become tumified, and the wood was in some sort gripped. It is useless to say, that there must have been serious injury; the coccyx was luxated, or fractured; the rectum lacerated, the skin, muscles, and vessels, horribly torn. From the retention of urine, the nerves of the bladder must have been involved. However, most remarkably fortunate, there was no paralysis of the lower extremities, which leads to suppose that the sacral plexuses were not injured, and that by good luck the stake had proceeded between the two sacral plexuses, to bury itself in the false vertebrae of the os sacrum.

The apparatus above described, by which the operation was performed, has been presented to the Society of Medicine together with the stake. The form of the latter is quadrilateral, it has neither knots, hooks, nor protuberances. Its length is eight inches, its thickness fifteen lines by twelve; the penetrating extremity being bevelled off, the other end which remained outside the wound is much smaller from having been unevenly broken.

Eight days have elapsed since the accident, and six since the extraction, and notwithstanding the enormous injuries inflicted, the state

of the patient is satisfactory.—(*Bulletin Médical de Bordeaux.*)—
Rev. Médicale, August, 1835.

Polypi of the Pharynx.—M. Capuron presented to the Academy of Medicine, a Report from M. Laserres d'Agen, on the *ligature of polypi whose insertion is at the cul de sac of the pharynx*. The subject was a young girl affected with polypus, which prevented her breathing through the nose, and impeded deglutition. To perform the operation, M. Laserres got constructed, first, two half sheaths of tin or silver, forming a groove containing an elastic blade of the same metal, having a curved extremity, and a channel capable of being converted into a loop, to which a string is fixed during the operation. Second, a *serre nœud*, to which is fixed a conical sound of the same metal. The base or large extremity is formed with a shield pierced with holes to receive the string, which is to be knotted upon the division which separates them; the other extremity is open. To this there is added a gum elastic bougie, with an iron wire stylet, and a well waxed thread. The patient is seated fronting the light, the stylet is introduced into the bougie, and the waxed thread attached to the latter; the end of the thread is attached to the middle of the ligature which traverses the *serre nœud*. The sound is then directed through the inferior meatus of the nasal fossæ, and is gently directed towards the root of the polypus, making it clear the *velum palati*. The stylet is then withdrawn, and the bougie brought out through the mouth. The thread is next disengaged, and the ligature which it draws with it is brought forward. The two half sheaths are then made fast to the loop formed by the ligature outside the mouth, and thence carried to the back of the pharynx and posterior surface of the polypus as far as the basilar apophysis of the occipital bone. Thus the base of the pedicle will be embraced. The two strands of the ligature are then drawn through the nostril, still engaged in the *serre nœud*; the latter is pushed forward as far as the root of the polypus, lowering its external end for the purpose of bringing the internal extremity near the basilar process. The pedicle of the tumour is next tightened; in drawing the ligature, the sheaths are disengaged and made to let go their hold. Then the two ends of the string are tied over the shield above described; In the case cited by M. Laserres, the polypus fell off after having been tightened by degrees, and the patient got well after some partial polypi had been torn away from the nostrils.—*Arch. Génér. Aug., 1835.*

Inflammation of the Pulmonary Veins.—Dr. R. Lee has related a case of this variety of phlebitis. The patient died in a month after a natural labour, having exhibited the ordinary symptoms of inflammation of the uterine veins, attended, in, the commencement, although not throughout the entire course of the disease, with more than ordinary dyspnoea, and pain in the left side of the chest. The

usual post mortem appearances, denoting the existence of phlebitis, were found in the uterus and its appendages, and the following is an account of the state of the parts in the thorax. "The serous surface of the middle and inferior lobes of the lungs on the right side, was covered with soft yellow lymph, and their substance was hepatized. On cutting into the left inferior lobe the pulmonary texture was found dense, and of a dark red colour; and pus escaped from two branches of the vein, which traversed this portion of the substance of the lung. On careful inspection of the venous trunk and branches of the left inferior lobe of the lungs, all the appearances usually seen in inflammation of veins in other internal organs of the body were observed. The trunk of the vein, near its entrance into the left auricle of the heart, was found plugged up with a soft yellowish coloured clot of lymph, firmly adherent to the inner surface of the vessel, and extending into several of its principal branches in the substance of the lung. The coagulum of lymph on the outer surface was of a bright scarlet colour, when separated from the vein. The smaller branches of the vein, into which the solid lymph did not extend, were filled with pus, and in some parts were coated with a delicate layer of yellow lymph."—*Medico-Chirurgical Transactions*, vol. ix.

Temperature of the Human Body.—M. Becquerel laid before the Academy of Sciences, the result of his researches, in concert with M. Breschet, on the temperature of the different parts of the body. These experiments refer to the difference of temperature produced by disease. They have used an apparatus constructed by M. Sorel, on a principle quite different from that employed to ascertain the temperature in health. The results are as follows:—

1st. A man, set. 37, typhus fever, complicated with bronchitis, 116 pulsations in the minute. 2d. A man, set. 24, enteritis, complicated with bronchitis, 116 pulsations. 3rd. A young scrofulous female, presenting a well-marked febrile state. 4th. A woman, set. 30, with a scrofulous tumour. 5th. A woman affected with cancer of the breast. 6th. A young man in a very well-marked febrile state. 7th. A young man affected with scrofulous caries of the bones of the foot. 8th. A man, set. 40, having hemiplegia of the left side, with senile gangrene, beginning to set in in the lower extremities. 9th. A woman, set. 45, numbness and pain in the lower extremities consequent on paraplegia, 84 pulsations a minute. 10th. A man, set. 60, with mercurial erythema. 11th. Ascites with affection of the heart. 12th. A man attacked with confluent smallpox some minutes before his death; 144 pulsations, and very weak. The following are the conclusions: 1st. the febrile state may give a degree of temperature which may go to 3° centigrade. 2nd. Much inflamed scrofulous tumours do not give much more increase of temperature, (the purulent parts do not participate in this increase.) 3rd. Cancer offers nothing remarkable, except a depression in all the parts examined. 4th. In paralysis the difference of

temperature between the healthy and paralyzed limbs is not remarkable.—*Archiv. Generales*, Aug. 1835.

Remedy against Sea Sickness.—At the Royal Academy of Medicine at Paris, a Dr. Fischer presented himself, asking for the authority of the Academy to make known through the journals a remedy which he says he has discovered against sea sickness. The remedy is composed of the seeds of a family of the strychnia, and of the fruit of a family of the menispermie, to be used in homeopathic doses.

M. Husson could not understand the meaning of the application, the gentleman being quite at liberty to announce his remedy as he thinks fit. M. Villeneuve immediately answered, that it was very plain what was sought for, viz. that the Homeopath would stick up at the top of his hand bills “ by the authority of the Academy.”

The application was very properly rejected ; but one gentleman, who is liable to sea sickness, said he is about to go to sea and will try the remedy, if the Homeopath will give him the drug.—*Rev. M.* Aug. 1834.

On Fracture of the Neck of the Thigh Bone.—Mr. Howship, in the last volume of the Medico-chirurgical Transactions, describes the consequences of this accident in nine examples, all old females. In the first, where death ensued after three weeks, the fracture was found to extend from the cartilaginous margin of the head above to within three quarters of an inch of the head below ; the separation of the bone was complete, but the ligamentous investment behind was entire, and half an inch of the neck was absorbed, the synovia and cartilages were stained with blood, and there was no appearance of union. The capsule was thickened and ecchymosed, and the round ligament livid and wasted. In the second case, aged 75, two months after the accident, the fracture was found to have pressed round the neck near the head, the ligamentous expansion remained entire behind, and was remarkably thick and compact. The capsule was thickened, a tender fibrinous band connected the cancellous structure, three quarters of an inch of the neck was absorbed, and blood was effused in the round ligament. In the third case, aged 78, after five months, the head was separated within the capsule ; the cartilage was red, the round ligament wasted, and the capsule thickened ; a grumous, granular mass covered the ends of the bones, and a fibrinous band ran between the broken pieces. In the fourth case, the capsule was thickened, the neck was separated about half an inch from the head ; there were no fibrous bands, but the surface of the upper fragment was covered with cartilage. The five other cases exhibited more or less of the same characters, and some of them afforded better examples of imperfect union, but in none was there a perfect osseous connexion.

Amaurosis produced by a Wound cured by Strychnine after the Endermic Plan, by Dr. Nicolo Norducci.—Nicola Jucci, set.

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fourteen, fell from her horse and received a kick which nearly detached the skin from the left eyebrow, leaving it hanging on the cheek. The bleeding was stopped, the wound cleaned, the integument restored to its place, and appropriate remedies administered. The wound cicatrized in twenty days, and the patient found herself well. The eye of the wounded side was examined and found to be amaurotic, and the pupil perfectly motionless. Thinking that the amaurosis resulted from lesion of the first branch of the fifth pair, the physician placed a blister above the eyebrow of the diseased eye, to which was afterwards applied a sixth of a grain of strychnine mixed with sugar, night and morning. The pupil recovered its mobility after the use of two grains of this remedy, and sight was perfectly restored.—(*Filiatre Sebezio.*)—*Archiv. General.* Aug. 1835.

MISCELLANEA.

Plan for establishing a University in London.—“ We have made for our readers the following abstract of the intentions of government in respect to the new Metropolitan University. It contains the substance of the documents which the council of the University of London have addressed to the proprietors, the better to prepare them for the subject of the general meeting on Wednesday next. It is intended to incorporate by charter certain persons eminent in literature and science, as the University of London, with power, after examination, to confer the academical degrees of A. B., A. M., B. L., D. L., B. M., D. M., in the three faculties of Arts, Law, and Medicine, on applicants of whatever religious persuasion, and without the imposition of any test or disqualification on account of religion. This principle of the absence of religious tests will be set forth distinctly in the charter. It is proposed to grant simultaneously to the body forming the present University of London a charter incorporating them as a college. Should they decline this charter, some other title will be selected for the new University. Whether they accept it or not, *they* will be recognized as a body whose certificates will entitle the possessor to be examined at the new University. *The members of this University are to be appointed*, both in the first instance and in future, *by the crown*; their number will not be limited; *their office will be held during good behaviour*. They are to be authorized to have assistants in cases of necessity, for the technical purposes of examination. On this part of the subject we are informed, that *very eminent and distinguished scholars* and men of learning *have been invited, and have consented to give their services to the public as examiners*, and first members of the new University. *Of persons applying to be examined for degrees at the metropolitan University, it will be required that they shall produce certificates*

from the present London University or King's College, for having gone through a course of study at one of those establishments, and of having attained a proficiency to pass for a degree, and of moral and correct conduct. The candidates for degrees will be classed according to their relative merits. Any collegiate or other institutions for education, whether in London or elsewhere, which afford to the public adequate security for good education, may from time to time be named by the crown, and have conferred on them the privilege of granting certificates for the examination of their pupils for admission to degrees by the new University. The metropolitan degrees so conferred would entitle the graduate to all the privileges and advantages, as regards civil rights and professions, not of an ecclesiastical character, nor extending to private endowments, which are connected with degrees at Oxford or Cambridge; and application would be made to parliament on the subject in the cases in which the authority of a statute may be required—such as the diminution in the case of graduates, of the term of service under articles of clerkship, &c. Fees are to be payable on the taking of degrees, and to be applied to the purposes of defraying the expenses of the examiners, but to be regulated by the treasury. The maximum it is proposed to fix at the stamp duty now payable by law on degrees at the English universities. If this fund should be insufficient, it would be for the government to consider in what manner it could best be augmented; and whether by application to parliament or otherwise. The king to be visitor. To the body so incorporated will be left the framing of the details for the regulation of the new University; but these are to be submitted to and sanctioned by the home secretary, and liable to be called for in parliament. Among these details will be the settling a course of examination. On this point it is thought advisable, that a written form of examination should be adopted, as far as it is practicable. The examination papers, the degrees granted, and the classification according to the proficiency of the student, to be published. The qualification of the person to be admitted for examination will practically and mainly be confided to the colleges at which he is educated, and from which he must have a certificate. It is assumed that those establishments will, for their own credit, impose such regulations as will render their certificate a real testimonial of solid and various acquirements. It is contemplated that a certificate should state the classes and lectures which the candidate has attended. The subjects for examination will be within the selection of the examiners; but it is the intention of the founders that that selection should embrace a wide circle of knowledge, and that it should be for the pupils to deal with the whole or with parts of the various papers of questions according to their respective abilities and acquirements. It is considered to be a matter for deliberation, whether the candidate for the superior degree should be required to pass a distinct and more extensive examination than that which would entitle him to the inferior degree; but it seems agreed that the higher

degree will not be conferred on one who has not taken the lower. The charter will contain provisions authorizing the acceptance of endowments, the subjects for which such endowments are made being first approved of by the University. But it is not otherwise intended at present to connect with degrees any rewards beyond the classifications for honours of the pupils examined, and the other civil privileges already alluded to."—*Globe Newspaper*.

We have marked in italics the passages to which we are anxious to direct the attention of the profession in Ireland. We at once recognize the spirit of the measure as regards our institutions. While allusion is made to Oxford and Cambridge no notice whatsoever is taken of Dublin. Connecting this with the treatment to which the Irish witnesses were subjected in the late parliamentary investigation, and the undisguised attempts to vilify the character of the Irish colleges, we do not hesitate to declare our conviction, that the safety of our institutions must depend upon our own exertions, and in these exertions we repose a well founded confidence. We must approach the contest in the ensuing session, united, cautious, determined, and unintimidated, seeking nothing unreasonable, but prepared to resist aggression, and oppose a manly front to any exhibition of imperious dictation.

In the document before us, there is a precious earnest of what is to follow. The examiners are to be named by the crown, they are to be paid by fees derived from students, and before the measure is brought before parliament they are *appointed!!!* "Eminent and distinguished scholars, and men of learning have been *invited*, and have *consented* to give their services to the public as *examiners*." "Fees are to be payable on the taking of degrees, and to be applied to defraying the expenses of the *examiners*." There is in this document another flagrant proof of selfishness and partiality. The right to have their certificates received as qualification for the degree, is *secured* to the present school called by its proprietors the London University, and to save appearances, King's College is included in the privilege: "of persons applying to be examined for degrees, at the metropolitan university *it will be required* that they shall produce certificates from the present London University and King's College," while every established college and respectable school is left at the mercy of some government official. "Any collegiate or other institutions for education, whether in London or elsewhere, which afford to the public adequate security for good education, *may* from time to time be named by the crown, and have conferred on them the privilege of granting certificates for the examination." We are at a loss to determine which should be most admired, the impudence or temerity of the concoctors of this plan. It is a barefaced attempt to trample on existing rights, and to seize by main force a superiority which they could not secure by fair competition. What is there in the nature or operations of this joint-stock school, which the speculators who got it up dubbed a University, to entitle it to peculiar privileges? We know not how the

teachers in the London medical schools may be inclined to act respecting this matter, but we know that the authors of this plan may rest assured, that we in Dublin will not submit tamely to be extinguished by them.

Prize proposed by the Royal Academy of Medicine of Paris for 1837.—The subject for the prize is as follows: “*to explain the analogies and differences between typhus and typhoid fevers.*”

In bringing forward discussion on this subject by a concours, the Academy wish to draw the attention of the friends of science to that important order of diseases denominated typhoid fevers; and at the same time, not to chain down men’s minds nor confine them to the strict terms of the question for which the prize is offered.

It is enough to say that they will receive most favourably, and encourage by the rewards at their disposal, all matters of interest relative to the philosophic history, nature, forms, symptomatology, anatomy, pathology, treatment, in fine to the numerous pathological conditions, and the different therapeutical indications, connected with these fevers.

In order to fix as to the present time the doctrine of these diseases, the Academy adds, that it will be necessary to begin with a critical digest of the materials accumulated on this subject, and that it will be useful to determine whatever useful information epochs, men, and research have left concerning these diseases. This subject occupies an immense space in the two-fold domain of science and art, and it has been so much and so often handled, that a philosophical treatise on the actual state of science in respect to it, would be the surest path to arrive at a solution of the problem.

Wherefore any labours undertaken with the last mentioned view of the subject, though they have no other object, shall be admitted as a matter of right to the concours, with the same prerogatives and the same conditions as all the other memoirs. The prize is 2000 francs, (nearly 80 guineas,) and will be awarded at the public sitting of 1837.—*Rev. Med. Aug. 1835.*

Erratum in Dr. Collins’s Work on Midwifery.—Dr. Collins requests us to insert the following extract from a note from Dr. Maunsell, addressed to him:

“ In your Treatise on Midwifery, lately published, I perceive that you have made use of a table, published by Dr. Churchill in the Dublin Medical Journal, and that you have inadvertently copied a typographical error in that table, from which it appears that in 1268 cases, treated by Dr. Cusack and myself in the Wellesley Institution, we had used the forceps thirty-one times. The fact is, that in the cases in question the forceps were only employed three times, as is rightly stated in Dr. Churchill’s manuscript; and consequently, instead of having performed thirty-seven operations in 1268 cases, or one in thirty-four, as you have been led to infer, Dr. Cusack and I only operated nine times, or about once in 140 cases.”

Correction in our last Number.—A leaf was awkwardly inserted in our last Number, immediately before the table of contents, to correct an error in the preceding Number, and to supply omissions in the list of the committee of the medical section of the British Association. We regret the occurrence, because it has the appearance of hurry, and want of due deliberation in our editorial councils. The correction was made and printed after the last page of the Number was struck off, and should have been placed at the end, not in the front, to proclaim our delinquencies.

Alarming News for the Hospital Surgeons of Ireland.—One of the melancholy personages who officiate in the temple of *Æsculapius dolens* in that part of the united kingdom called Ireland, and who discharges for the Lancet, in Dublin, the functions which his worthy predecessor and congener the celebrated James O'Brien, exercised for his employers, makes the following alarming announcement: “sooner or later will the *inhabitants* of Ireland either *force open* the existing institutions, or *possess institutions of their own*. They are intent upon this course.” Oh! son of Congalach, who was the son of Maolmitheach, who was, or ought to have been, king of Ireland! the *inhabitants* have as little inclination to be mutilated by you or yours in the hospitals, as they have to accept martyrdom at your hands, in their own dwellings, and that your fee book, if you have such a thing, testifies with many a blank forlorn. Oh! son of Congalach,

“Our ancestors wore crowns upon their brow,
But faith their sons want half crowns now.”

Medical Reform.—Since our last we have received one or two matronly morsels of advice, accompanied with badly disguised threats of consequences, and from other quarters fulminations of vengeance and ludicrous announcements of loss of patronage in high and influential quarters, which vividly remind us of the heroic resolves of Tom Thumb, or the swaggerings of the ancient Pistol. For the benefit of such correspondents, we translate a short story, extracted, for aught we know, from a celebrated work entitled the *Laus Stultitiae*, which we recommend to the perusal of those learned Thebans.

“Once on a time, a Spanish gentleman walking through a meadow, was assailed by a famished cur, who attacked him with all the fury which hunger and a savage disposition generate. The gentleman very quietly pinned him to the ground with a spear which he held in his hand, and the vociferous asserter of the canine rights of tooth and nail, struggled, snarled, growled, and died. The owner, on coming up, complained bitterly, and asked the gentleman why he had not struck the animal with the blunt end of his weapon, to which Don replied, with characteristic gravity, “so I should friend, had your gentle associate ran at me tail foremost.” The application we leave to those who walk abroad with bipeds of the same description at their heels. As to the threadbare twaddle about monopoly, libe-

rality, and the rest of the patriot's vocabulary, we have to remind our friends that these, as well as many other words in our language, have changed their meaning like the word *occupy*, which Dame Quickly says was an excellent word until it was misused. Monopoly, we take it, at present means the possession of some infirmary, dispensary, gaol, or lunatic asylum, after which some rampant reformer yearns, and liberality, the disposition to gratify the wishes or relieve the necessities of obsequious toad-eaters and unscrupulous partisans. Gentlemen, reformers as you call yourselves, you are found out; you want no reform, you want no improvement, you want no protection for the poor man in his bed of sickness, nor for the friendless student in his arduous struggle in pursuit of knowledge, you want change, you want destruction, in a word, you want a scramble. But you shall not have it, your reward shall be the parings of the apple of discord, which you have been flinging into every society and every institution into which you have been permitted to intrude. Real reform, where necessary, substantial improvement, and those changes which time has rendered necessary, we advocate and recommend with the most heartfelt sincerity, but against those selfish impostors, who, impelled by the dictates of a malignant disposition, or the still stronger motive necessity, secretly assail the institutions of their country, and characters of all who are respected, regardless of oaths, and reckless of consequences, we wage a war which we hope shall terminate only in their extermination. We would warn all who regard their characters to abstain from communication with the fraternity to which we allude. They have hitherto been permitted to pursue their course with impunity, because it was obvious that the antidote accompanied the poison, and that all who cherished the feelings of gentlemen must ultimately be disgusted and alarmed. The result has verified the correctness of the view, they now writhe on the wheel they placed for others, and it only remains for us in mercy to administer the "*coup de grace*."

Preparatory School of Medicine.—It appears from a notice in the *Archives Generales*, that an attempt has been made in Paris to establish a school, or branch of a school, for the instruction of boys destined for the medical profession, to afford them that description of information which is suited to their subsequent studies. The attempt is a laudable one, but the execution must be difficult; we should rejoice to see something of the kind in Ireland, not indeed to narrow the student's education to the cultivation of medical science merely, but to secure for him that extent of general information which should establish his superiority over the other classes who so pertinaciously reject all such information, and suppose themselves educated if they be capable of reading a Greek or Latin classic imperfectly.

We recollect some years ago hearing a gentleman, in a public lecture in Dublin, forcibly inculcate the advantage to medical men of keeping perpetually in view the apothegm that "knowledge is power," and with all the sincerity of conviction and zeal for the attainment of his object urge vehemently the necessity for improvement. We recollect also reading, the next week, a notice of this lecture in one

London Weekly Medical Journal, deriding the sentiment, and abusing the author in all the coarse and stupid phraseology of trading partisan criticism. We could not avoid feeling satisfaction, and entertaining hopes, which we believe were well founded, that an assembly of young men, where such sentiments were applauded, promised better than any community fostering principles inculcated in the publication alluded to. We are convinced that medical men enjoy opportunities, inaccessible to the other classes, which, if cultivated, peculiarly qualify them to give the right direction to the moral and physical education of their children. We should, therefore, rejoice to see an association formed among them for the attainment of this object, and we shall, probably, if this hint be taken in good part, return to the subject, and place the matter before our readers in a more tangible form.

Medico-Chirurgical Transactions.—We rejoice to meet our old friend, hale, hearty, and vigorous, notwithstanding the metamorphosis from simple citizenship to the aristocratic honours of a charter and a lofty title. We congratulate the *Royal Medico-Chirurgical Society* on taking its place among the permanent institutions of the country, and securing protection for its property against those sudden attacks of fever and delirium to which such institutions are as liable as the individuals who compose them. But have not the members pursued a dangerous and doubtful course? Do we not hear on all hands, that John Cade has written to his constituents to assure them that he has been informed, on the highest authority, that those sinks of corruption colleges and chartered institutions, shall be razed to their foundations, and joint-stock knowledge houses, “*ære perennius*,” erected in their places. Be that as it may, we rejoice to see a new volume full of interesting matter from this society, which latterly exhibited some of the stiffness and debility of advanced life. The papers are on Fractures of the Neck of the Femur, by Mr. Howship. On Warty Tumors in Cicatrices, by Mr. Caesar Hawkins. A Case of Abdominal Tumour, by Mr. Howship. A Case of Pulmonary Phlebitis, by Dr. Lee. On Ulceration of the Cartilages of the Joints, by Mr. Mayo. On Laceration of the peritoneal Coat of the Uterus, by Mr. Partridge. On the Chemical Constitution of calcareous Tumours of the Uterus, by Dr. Bostock. On fibro-calcareous Tumours, and Polypi of the Uterus, by Dr. Lee. On the Ulcerative Process, by Mr. Key. On Malformation of the Ear, by Mr. Cock. On the same by Mr. Thurnam. On Mental Derangement treated by Acetate of Morphia, by Dr. Seymour. On Adhesions of the Peritoneum, by Dr. Bright. On the Medicinal Properties of Creosote, by Dr. Elliotson. On the Functions of the Foetal Kidney, by Dr. Lee. On Fractures of the Pelvis, by Mr. Earle. On serous Effusions from the Membranes of the Brain, by Dr. Sims. On Hypertrophy and Atrophy of the Brain, by the same; and on Softening of the Brain by the same.

Not having received the volume until the matter of our scientific intelligence had been arranged, we are obliged to postpone the detailed notice of its contents until our next number.

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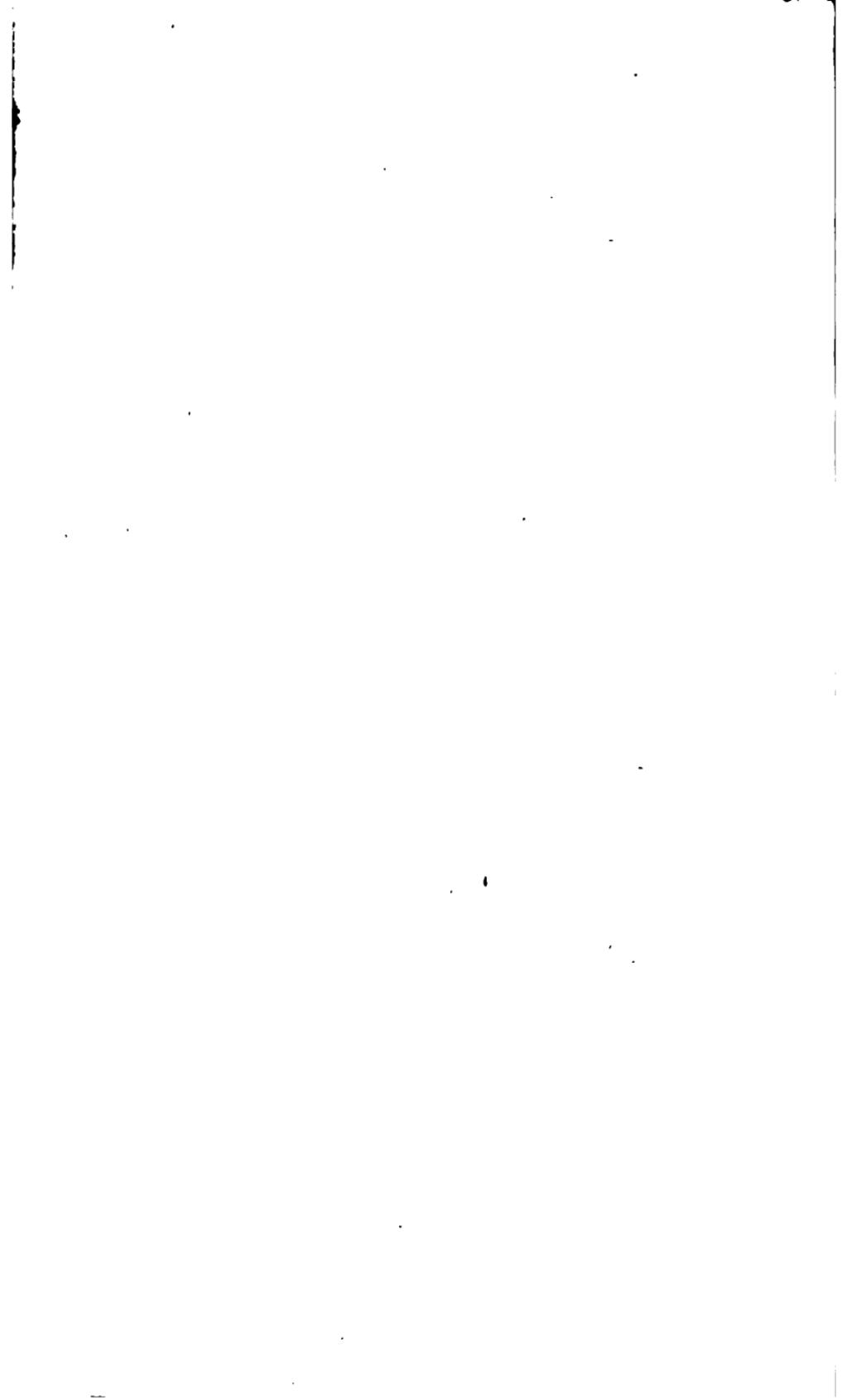
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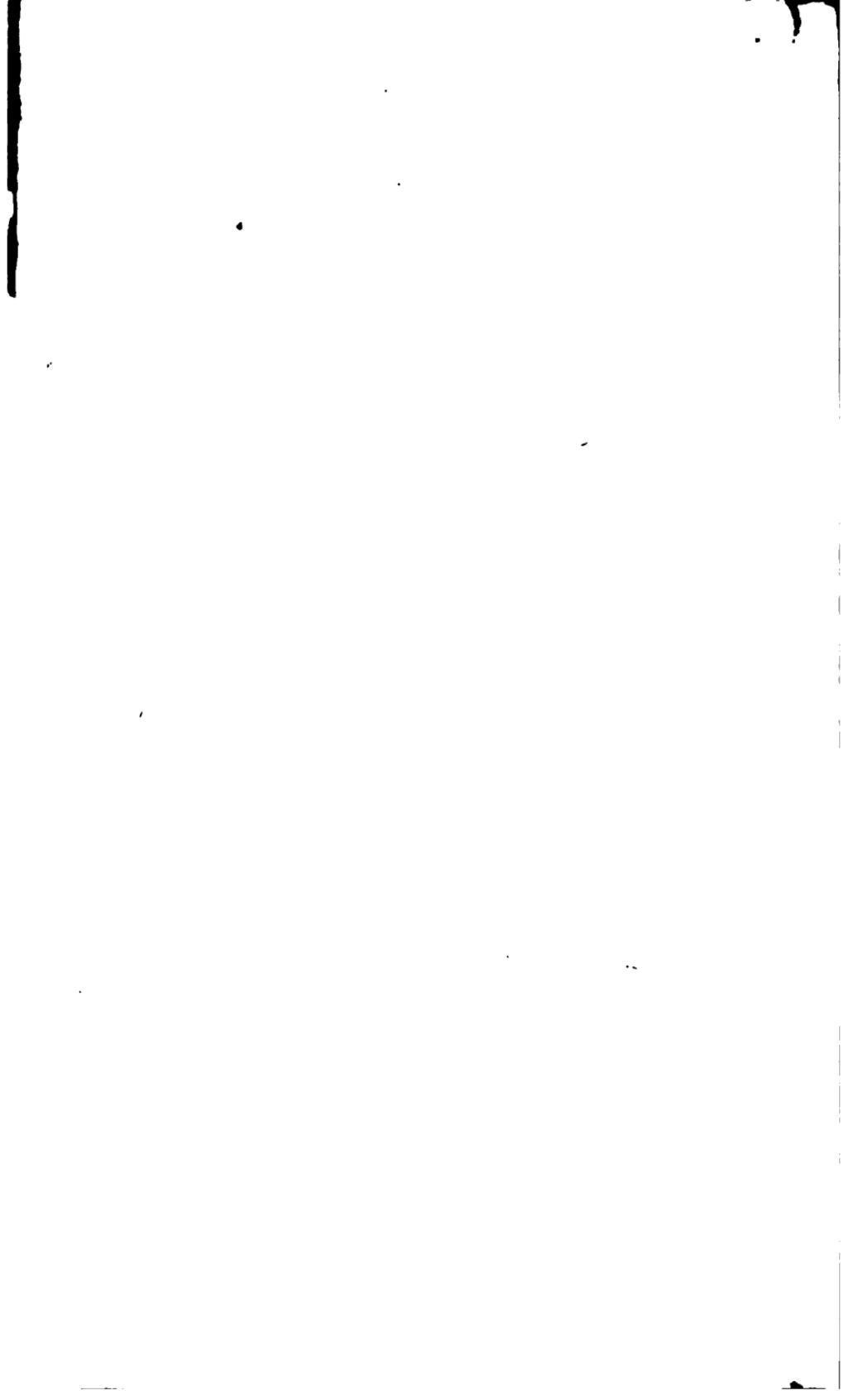
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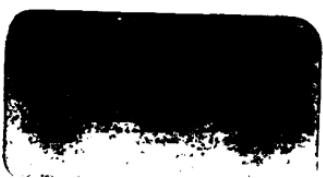














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